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The Efficiency of Patent Protection

IN the very early days of industry the manufacturer who was able by his own ingenuity to produce a better article than his competitors was forced to keep his process secret if he were to reap any substantial reward for his efforts. This secrecy was necessary because if his process became known to his competitors and imitated by them it was extremely difficult to obtain satisfactory redress at law. There was also the disadvantage that as full details of the invention were not made public, succeeding generations might not benefit from the discovery.

The patent system was first introduced to overcome these faults by giving the inventor a working monopoly of his process for a definite period, after which it became public property. Obviously the scheme could only function satisfactorily if the patent specification defined very clearly the limits to the scope of the invention, so that any case of infringement could be readily detected. Further, it was necessary for the specification to set out full details of the process of the invention so that any member of the public reasonably skilled in the art could adopt the process without undue experimentation when the period of the inventor's monopoly had expired. The ideal patent system, therefore, is an encouragement to invention by ensuring that the inventor shall have adequate opportunity to obtain material benefits from the invention and that he can work his invention quite openly with the knowledge that he will be compensated for any infringement of his monopoly by others. At present, however, it must be admitted that there are numerous works in the country operated in an atmosphere of the closest secrecy. The reasons for this secrecy may be many and diverse, but it is certain that some are so operated for the sole reason that they are utilising a novel process. Such works are a reproach to the efficiency of our patent system.

On considering the system in this country certain criticisms readily jump to mind. In the first place, the inventor is required to make a considerable financial outlay in numerous statutory charges, such as sealing fees, and payments to patent agents, etc., in obtaining his patent. He may then find that his patent which has been granted by the Patent Office may be declared invalid in subsequent litigation in the courts; in addition, he may of course be liable to legal expenses in obtaining this declaration. The inventor would be justified in asking why he should be called upon to pay for a document which can turn out to be not worth the paper it is written on. But the system lays itself open to even more sinister results. The inventor who has what he believes to be a genuine patentable invention may, as we have said, become the possessor of an invalid patent (and he is accordingly inclined to secret working of his invention rather than run this risk). It is a natural consequence that an inventor can apply for a patent knowing it to be invalid if granted. He can do this, for example, by making the basis of his invention too broad for legal validity and yet have it accepted, and the specification published, by the Patent Office. Thus the door is opened to blocking patents which are designed to prevent a competitor from ploughing too near the patentee's own particular furrow in the industrial field. These patents are a harmful deterrent to industrial progress and contrary to the whole principle of patent monopoly.

It is easy enough to make these criticisms, but it is extremely difficult to suggest remedies. The section of our law relating to patents is probably the most complicated in the whole of the country's legislation. The position is even more complex perhaps in the chemical industry where in so many cases the product does not indicate by its appearance by what process it has been made. Detection of infringement is thereby made extremely difficult and secrecy in manufacture encouraged. From the industry's point of view probably the most harmful fault of the patent system is the granting of blocking patents. This is by no means a new development. Blocking patents have been issued for many years, but there appears to have been little effort made to prevent their appearance. The obvious solution would be the issue of a certificate of legal validity with every patent specification accepted and published by the Patent Office. But the practical difficulties in the way of this method are formidable; the lengthy legal arguments and the dissenting testimonies of expert witnesses when it is sought to determine the validity of a patent in the courts are well known. Nevertheless, co-operation between industry and patent experts should at least reduce the number of invalid patents granted if they could not be entirely eliminated in the more distant future.

Under existing laws, in most countries at least, genuine protection is obtainable, because a patent granted after a careful search by the Office may nevertheless be disputed as regards its validity, from any point of view.

—*H. Stafford Hatfield.*

NOTES AND COMMENTS

Trade Figures for 1938

THE summary of the general trade position for 1938 provided by the Board of Trade returns for December confirms the gradual improvement in export business which has been evident during recent months. On the whole year, however, there was a fall in total exports of £64 millions, compared with 1937. On the other hand, imports fell by the striking amount of more than £107 millions with consequent decrease in the adverse balance of visible trade of over £43 millions. The complete figures for last year's trade in chemicals, drugs, dyes and colours show that imports fell by £642,907 to £13,214,627, compared with 1937, and exports by £2,604,414 to £22,048,681. Nevertheless both categories show considerable improvement over the trade figures for 1936. During the past year there were notable increases in the imports of potassium chloride, potassium sulphate and sodium cyanide, while important decreases were shown in acetic and boric acids, borax, calcium superphosphate, sodium chromate and bichromate, dyestuffs, white lead, metallic pigments, and carbon blacks. There were few increases in individual items of the chemical export trade, the total decrease being spread fairly evenly between the various products. There were, however, especially large drops in exports of aluminium compounds, bleaching powder, cresylic acid, tar and creosote oils, manufactured fertilisers, glycerine, sodium carbonate (including soda crystals, soda ash and bicarbonate) and dyestuffs.

Intra-Empire Trade

EVEN at a time when the exporter has probably had to face more difficult trading conditions than ever before, the case reported by our South African correspondent in which tenders for a certain supply of chemicals locally was limited to three German firms is exceptionally unprincipled. Clearly this restriction was due to pro-German sympathies well-known to exist in certain limited areas of the Dominion. Is it not time that definite action was taken to meet such methods? The exclusion of certain countries from tendering for Empire contracts would be an obvious and effective retaliation. Such a course would be repugnant to many, but the *laissez faire* attitude can do little against this type of competition. While we are obtaining valuable results in trade agreements with other countries, determined efforts should be made to encourage trade between the Empire countries which should be united by a bond far stronger and more lasting than that of any ordinary trade agreement.

Bud-Forcing Substances

RECENT investigations have thrown much light on the chemical nature of the changes underlying plant growth and as a consequence several synthetic organic substances, for example, indolylacetic acid, have been found to be effective in stimulating plant growth and root formation. But a similar problem, that of the chemical mechanism of bud and flower formation, seems to have received far less attention. It has long been known that the growth of buds formed during the late summer, and remaining dormant until the following spring, is due to chemical changes in the buds brought about by the cold weather of winter, and that the dormancy can often be overcome by storage at artificial low temperatures. Dr. W. Crocker, managing director of the Boyce Thompson Institute for Plant Research, in an address to a recent meeting of the American Chemical Society, described attempts made at the Institute to find chemical substances which could be applied to the plant to overcome bud dormancy rapidly without the months of delay necessary with the low temperature and similar treatments. Of the several hundred chemical products studied, ethylene chlorhydrin and sodium and potassium thiocyanate were found to be highly effective. Ethylene chlorhydrin was especially suitable for bud growing, because it can be applied either as a gas in a fumigation chamber or as an aqueous solution in which the plant parts are soaked. Thiocarbamide also proved effective as a bud forcing chemical. This compound has other interesting effects; it breaks up control of one bud over another so that several, instead of one, are forced to grow in the eye of the potato, and it is also a very effective anti-oxidant for plant enzymes that act on the phenolic types of compounds. It is said to have important industrial applications in this field.

Pioneer of the Acetate Silk Industry Honoured

DR. HENRY DREYFUS, chairman and joint managing director of British Celanese, Ltd., to whom the Perkin medal of the Society of Dyers and Colourists was presented on Thursday, belongs to that select company of men who have conceived an idea and largely by their own efforts have built up a major industry in putting that idea into practice. Shortly after the war, Dr. Dreyfus decided to make cellulose acetate artificial silk on an industrial scale. He had unique experience in manufacturing cellulose acetate film and dopes, but the production of silk from this material had never been attempted before commercially. The number of technical difficulties encountered in the project must have been enormous. The cellulose acetate had to be prepared under carefully controlled conditions, it then had to be ripened to the right degree of acetone-solubility and the solution spun through fine jets into a hot evaporative atmosphere, from which it was essential to recover the solvent as efficiently as possible. Although the subsequent weaving or knitting was mainly according to standard textile practice, the dyeing and finishing of the materials demanded revolutionary methods. Thus, as the fibres had no affinity for the usual dyestuffs, special dyestuffs for acetate silk had to be, and were successfully, found. The story of the industry's development must be one of the most interesting in the whole of industrial research, and its present achievements are due in no small measure to the personal inventive skill and tenacity of Dr. Dreyfus and his brother, Dr. Camille Dreyfus.

An Indication of Further Trade Recovery

IT is surprising in some respects that the number of new companies registered last year show a decline of only 1 per cent. on 1937, in spite of the September crisis, according to figures issued by Jordans and Sons, Ltd. In the chemicals group there were 4 public companies registered with a total capital of £2,251,000 and 472 private companies with a capital of £2,199,975. The aggregate capital of £4,450,975 places the chemicals group fourth in order of precedence as regards capital. Jordan's forecast for the year states: " It is certain that industry is at the point of further recovery and, given a freedom from further international political trade, will resume its full activity."

Some Non-Textile Uses of Dyestuffs

By
"COLOURIST"

DYES are not used exclusively for the colouring of textiles, although the importance of the dye industry is mainly due to the vast interests of the textile industry with which "dyeing" is associated. In non-textile applications they do not receive much publicity; nevertheless, the value of the dyes so consumed in any one year is considerable. The need for colour in manufactured goods existed long before Perkin made the first so-called "coal tar colour," and when dyes in countless colours began to be produced they were soon pressed into service for non-textile uses in substitution for such natural colouring matters as indigo and madder. Soaps, polishes, inks, paper, hair and bone have each created a demand, but a number of unusual applications has also arisen, such as the dyeing of bath sponges, motor greases, match compositions, sheep dips, etc. Articles made from vegetable ivory, hardened casein, celluloid, and plaster and papier-maché compositions, have likewise needed colour.

Dyeing Bone Articles

Bone is utilised for a wide variety of articles, in the course of which it is shaped by knife or turned on the lathe, and polished, and sometimes dyed. For bright colours acid and basic dyes are used, with acetic acid in the dye bath. The dyeing operation is carried out at the boil, a period of fifteen to thirty minutes in most cases being suitable to effect the degree of penetration which is needed. The basic colours used include Rhodamine, Methyl Violet, Methylene Blue, Malachite Green and Magenta; for acid and chrome colours there is Patent Blue, Soluble Blue, Fast Acid Violet, Indian Yellow and Acid Scarlet. If black is to be developed in imitation of ebony, a logwood black is obtained by boiling for fifteen to twenty minutes in a fairly strong solution of logwood extract and then transferring to a 5 per cent. bath of copperas (ferrous sulphate) which is also at boiling point. After removal from the copperas, where the bone acquires its black colour, it is only necessary to rinse well in cold water.

From bone, which is used extensively amongst other things for buttons, it is easy to pass to other button materials, such as vegetable ivory, horn, casein, mother-of-pearl, and the present-day range of synthetic resins. Vegetable ivory, from the coroza tree of South America, is widely used and the button-maker generally obtains his colours by level-dyeing acid dyes, such as Lissamine Fast Yellow 2GS, Solway Blue BS and Azo Geranine 2GS, as well as by vegetable extracts. The acid dyes are used in aqueous solution at the boil; acid, if present, has a tendency to split the buttons or otherwise distort the shape. Buttons which have been made from hardened casein can be coloured in two ways, and offer the production of a wide range of shades. Either the raw powdered casein may be dyed from an aqueous solution prior to being moulded and subsequently hardened by formaldehyde in the form of rods from which the buttons are cut, or, alternatively, hardened white blanks may be dyed direct. After-dyeing is done by immersing the blanks in a bath containing an acid dye and a small amount of formic acid at a temperature of 70° to 80° C., Coomassie Yellow RS, Naphthalene Scarlet RS, Naphthalene Red EAS, Disulphine Blue AS and Naphthalene Black BS being widely used.

Colouring Synthetic Resins with Dyestuffs

Synthetic resins in the form of buttons are dyed quite well by aqueous solutions of basic dyes. If they show a tendency to take "bronze-like" effects, the trouble can be prevented by using Cellosolve up to an amount of 20 per cent. of the volume of dye liquor used. Speaking particularly of phenolic moulding powders, as the resinoid is yellow or brown it must always be tinted by an organic dyestuff if a brownish coloured article is not required. Wood meal used as the filler may be coloured prior to being used; the colours so obtained, however, are liable to fade during the mixing and moulding operations and this method of colouring generally proves to be more expensive than the incorporation of mineral pigments, in which the colour range is necessarily limited to yellow, red, brown and purple as an ochre or oxide. Lake colours, in which a mineral base such as clay or alumina is dyed by an organic dyestuff, also provide a means of colouring but the colours so obtained are less resistant to heat and to the action of the resinoid than in the case of mineral colours. One particular application for a dyestuff is interesting, for where carbon black is used to provide a black moulding powder the moulded resin will often acquire a somewhat greenish tint, rather than a true black, unless a blue-black dye is incorporated. For urea and thiourea moulding powders, which are much less plastic during the moulding process by comparison with powders of the phenolic class, wood meal can be dyed with reasonably good permanency for moulding conditions, and there is ultimately good permanency under exposure to sunlight. Suitable dyes are now available which give coloured translucent effects or pastel shades when a small quantity of a white pigment is also present. For translucent effects, however, wood meal must be replaced by cellulose pulp made from either highly bleached wood or bleached cotton.

Basic dyes, such as Auramine, Rhodamine BS and Thionine Blue GS, can be used for dyeing mother-of-pearl, but it is necessary for this material to remain immersed in the dye bath for at least two days and often for as long as five days. It is also necessary to de-grease mother-of-pearl by washing in caustic soda before dyeing, as a considerable amount of oil is acquired in the operation of machining the article from the natural shell. Mother-of-pearl effects can be obtained upon buttons cut from horn by treating the horn with lead salts and forming an insoluble lead salt by double decomposition. If the horn is first dyed, the light reflected by the metallic salt will give a pearl effect which is also a coloured effect.

Precautions when Dyeing Wood

Where wood is used in button-making, the finished buttons are coloured with dyestuffs which are soluble in methylated spirit, petroleum spirit or solvent naphtha. Basic colours are often used, especially in the case of wood articles other than buttons, the dyeing being done either by dipping in a hot dye bath or by applying a solution of the dye to certain parts of the articles only (as in the case of toys) by brush. Very bright colours can be produced by dyes of the Eosin type, using a hot dye bath containing a small quantity of acetic acid and alum When dyes are applied to wood by dipping it is especially desirable to use only such dyes as are absorbed by the wood at a quick rate, for the reason that lengthy contact with hot dye liquor causes the wood to swell and there is consequently a risk of warping and splitting. The temperature of the dye bath should not exceed 82° C.

In some cases black or brown dyes are mixed with fungicides used for the treatment of wood for carriage work, the object being to show just which parts of the construction have been treated, the fungicidal solution itself being practically colourless and not capable of indicating where it has been applied.

Cork, when used by the toy-maker, has often to be coloured. As the natural colour is a peculiar brownish shade a partial bleaching is necessary before it can acquire the bright colours demanded. Articles made from cork are therefore immersed first in a lukewarm solution of potassium permanganate (about 1 oz. to 4 or 5 gallons of water) for 30 minutes. The

cork is kept from floating by being placed in a string bag suitably weighted by a piece of stone. When the cork has acquired a distinct light brown colour by this treatment it is transferred for 30 minutes to a cold bleaching bath containing very dilute sodium bisulphite acidified with sulphuric acid. Bleaching can be done also by a cold solution of sodium hypochlorite (2° Tw.), immersion being necessary for several hours in this case. After bleaching the cork is dyed in a boiling bath of basic dyestuff, to which a little acetic acid has been added. Malachite Green, Methylene Green G, Acridine Yellow, Rhodamine, Methyl Violet BB, Victoria Blue and Bismark Brown are suitable basic dyes. Immersion in the boiling dye bath should be limited to a few minutes.

In dyeing sponges the natural dark brown colouring matter is first bleached, immersion for 30 minutes in 0.25 per cent. potassium permanganate being followed (after squeezing) by immersion in 1 per cent. sodium hydrosulphite. After this treatment the sponges are well rinsed in cold water, soaped in a 1 per cent. soap solution, and then dyed with Caledon and Durindone colours. The dye baths cannot be prepared with caustic soda, but reduction in the presence of sodium phosphate is satisfactory. After dyeing, it is necessary to allow the sponges to oxidise for 15 minutes, prior to scouring them with warm and very dilute acetic acid. The final treatment consists in rinsing in cold water and soaping for 10 minutes in a 1 per cent. hot soap solution.

Dyestuffs for Straw and Raffia Plait

For straw and raffia plait, where there is need for bright colours, a hot solution of an appropriate basic dyestuff can be used; acid and substantive dyestuffs are also suitable, the acid colours being applied at the boil with 5 to 10 per cent. of alum in the bath, and the substantive colours also at the boil with 5 per cent. of common salt. The most satisfactory results are obtained when a short boil is followed by allowing the material to "feed" as the bath cools.

Paper is generally coloured by dyeing the fibres before they are made into the felted sheet, but for some grades of paper the colouring is done later. Dyes are added to the stock in the beater after the loading material has been added and usually after the sizing material has been taken up by the fibre; the size is very useful for subsequent application of a dye as it acts similarly to a mordant in textile dyeing. In some cases dyes are used for the special purpose of off-setting complementary colours in the fibres used for making white paper; a bluish-white colour is obtained by adding a blue dye to the paper stock.

Plastic and papier mâché compositions are usually coloured by short immersion in basic dyestuff baths. Plaster absorbs the dye very readily, and results are liable to be patchy if the strength of the bath is too high. For papier mâché, precautions must be taken to ascertain that the bath is not too hot as the material may easily swell and warp. Both acid and substantive dyes are used also for papier mâché, the former being applied from an alum bath and the latter from Glauber salt or common salt.

Celluloid is commonly coloured by immersion in a cold bath of either acid or basic dye, without an assistant. Malachite Green, Methylene Green, Methylene Blue, Methyl Violet, Saffranine, Auramine and Magenta are suitable basic dyes; acid dyes include Croceine Scarlet, Tartrazine, Orange II, Patent Blue, Sulphocyanine Navy Blue and Naphthol Blue Black. The surface colouration of pre-formed celluloid articles is usually done with an appropriate dye dissolved in a mixture of solvents, such as acetone and ether, ether being needed to prevent excessive swelling of the celluloid. Transparent paper made from viscose is coloured with direct cotton and basic dyestuffs.

Either water-soluble or oil-soluble dyes can be used for colouring soap, provided they are fast to heat and to the action of alkali. A wider choice of shades is possible in the case of fancy toilet soaps, compared with household soap, as these soaps are coloured by applying an aqueous solution of the dye to soap chips, which are then cold milled to ensure even distribution. The coloured product is finally pressed into tablet form. For coloured bath salts the aqueous solution of a dye which is fast to alkali is sprinkled upon the crystals, and the mass of crystals is then churned together to obtain an even distribution of colour at the desired tint. Wax candles for decorative purposes are coloured by incorporating an oil-soluble dye in the molten mixture of paraffin wax and stearine from which the candles are cast.

There are many unusual applications for dyestuffs in modern manufacturing processes. Motor greases are treated with dyes of yellow, orange or brown tint, fastness to heat and alkali being necessary. Hydrocarbon solvents which have a slightly yellowish cast are "whitened" by the use of Waxoline Blue, which is soluble in the solvent and therefore evenly distributed in minute percentage throughout large quantities. Waxoline Red is sometimes used to indicate the presence of a toxic addition to petrol, as for example the addition of lead tetraethyl. Waxoline Green provides a ready means by which petrol distillers may colour their own products for purposes of identification. Similar applications to these are found in the colouring of sheep dips and certain insecticides to indicate the presence of arsenic, and in the case of providing means to identify seeds which have been specially dressed prior to sowing to protect them from pests. In the last-named instance a small quantity of the petrol-soluble dye, Agrosan G, is added to the dressing and subsequently identified by immersing a few of the suspected seeds in petrol.

The colourings of match compositions is also an interesting application for dyestuffs. A concentrated solution made from basic dyes, such as Rhodamine B500, Magenta and Victoria Blue B150, can be mixed with the composition before application to the match sticks. Alternatively, the match heads are dipped into an alcoholic solution of basic dye.

As one further example of non-textile uses reference can be made to the colouring of aluminium hardware goods as part of the anodic process which was introduced for producing films of oxide upon the metal after manufacture in order to prevent corrosion. This oxide coating, which is hard and coherent, acts very successfully as a mordant when certain dyes are applied. The actual colour and effect depends upon the purity of the aluminium or the composition of an aluminium alloy, as also upon conditions under which the deposition of the oxide coating takes place. This coating should preferably be dyed immediately the anodic treatment has been completed, the metal being first rinsed in cold water and then placed in the dye bath where the dyeing is allowed to proceed slowly. Unless this is done the colour will be patchy and the general effect unsatisfactory. Dyestuffs which give good results under most conditions are Solway Blue BS, Solway Green GS, Solochrome Yellow YS and Solochrome Brown.

Chemical Club

Dr. Olaf Bloch, F.I.C., chief chemist of Ilford, Ltd., will be the speaker at the next meeting of the Club on Monday next, January 23. The title of his informal lecture is "The Answer is in the Negative," and it will be illustrated by slides and films, many of which have not been shown before. He will range over the whole of the applications of photography to science, industry and social conditions, and it is expected that in regard to the last of these applications there will be most unusual subject matter, in view of Dr. Bloch's contact with Scotland Yard. The talk commences at 8.15 p.m., and will be preceded by an informal dinner at 7.15 to which members may bring guests.

The previous talk, on December 19, by Professor H. D. Kay, O.B.E., D.Sc., Director of the National Institute for Research in Dairying at Reading University, attracted a large audience and provided an extremely lively discussion. As is well known, no report of these talks is published, and in the confidential atmosphere thus provided both speaker and audience deal freely with persons and things.

Oil and Colour Chemists' Association

Professor Ostwald's Lecture on Swelling and Solubility—Presentation to Dr. G. F. New

AT a meeting of the Oil and Colour Chemists' Association held in London on January 12, a lecture on "Swelling and Solubility of High Molecular Weight Compounds," was given by PROFESSOR DR. WOLFGANG OSTWALD, of Leipzig. The chair at the opening of the meeting was taken by MR. A. J. GIBSON (President of the Association).

A Presentation to Dr. New

The President, in opening the meeting, said the Association was entering the 21st year of its existence and it would be agreed that nothing was more auspicious. Before coming to the lecture by Dr. Ostwald he had a very pleasant duty to perform. He said that Dr. New, during his office of President, had put in two years' very hard work in the interests of the Association and it was now a privilege and pleasure to hand to him a small token of the appreciation of the members and officers of the Association of his services during those two years. The President then handed to Dr. New copies of the bound volumes of the Proceedings of the Association during the two years he had been President, which were suitably inscribed in appreciation of his services during his period of office as President of the Association.

DR. G. F. NEW, acknowledging the volumes, said it was really quite redundant to add these very acceptable gifts to the honour that had been done him when he was made President of the Association for two years. During that time he had enjoyed a magnificent backing from the whole team of voluntary workers which constituted the motive force of the Association.

The President then asked PROFESSOR F. G. DONNAN, F.R.S., to take the chair. Professor Donnan said he regarded it as a very great honour to be asked to take the chair on such an occasion. He knew Professor Ostwald when he was only 7 years old, and it was certain that Professor Ostwald had done a great deal since the days when he himself worked in Professor Ostwald's father's laboratory. The subject upon which Professor Ostwald was to lecture was one which interested every sort of chemist nowadays and it was one upon which a great deal had been done in Germany during the past 12 years by Professor Ostwald himself, and earlier than that by other workers. The more recent work, however, in colloid chemistry had been due to the inspiration of Professor Ostwald.

Professor Ostwald's Lecture

PROFESSOR OSTWALD said it was an honour to have the opportunity of speaking on some work which had been done during the past seven years at the University of Leipzig on the swelling and solubility of high molecular weight compounds. It would be generally agreed that the main problem of solubility was one of the most obstinate problems which the chemist knew. There were such questions as why india rubber swelled in benzene and not in water and why gelatine did just the reverse. Again, why did certain pure liquids alone have no activity on certain substances when the same liquids did. These and other related problems were irritating questions, but he did not propose to try and answer them. His object was rather to try and show how such obstinate problems might be approached. To say, as the old chemists did, that substances dissolved in liquids containing similar groups to themselves was only a very rough kind of rule. Hardy, Langmuir and others had done a great deal in the application of solubility phenomena and he himself applied for a patent in 1907 which made use of so-called linking substances or coupling substances. Everybody knew that water would not dissolve in benzene, but if a little alcohol was added there was quite good miscibility. There were also other rules which started from another point of view. There were, for instance, physico-chemical properties, such as surface tension and others, which played a part and it had been shown that the solubility of certain sols was proportional to the dielectric constant. Such rules might hold for 15 or 20 liquids but further experiment showed there were more and more exceptions.

The Inductive Scientific Approach

After referring to some of the workers in this field and the ideas they had put forward, Professor Ostwald said that the colloid chemist who occupied himself with the solubility data of high molecular weight compounds had to confess that the real physico-chemical approach was missing in many cases. The dissolving of high molecular weight substances obeyed absolutely different rules compared with the dissolving of other substances. If one made a solution of high molecular weight substances at a certain temperature the effect was not reversible and the physical chemist was in some difficulty as to how he was going to treat this phenomenon. At the moment the best way seemed to be to proceed on the lines of inductive science, and he proposed to show a number of inductive charts relating to high molecular weight compounds. In the experiments to which these charts related he had taken about 16 different substances of high molecular weight and 60 different solvents and had arrived at 1,088 combinations. During the experiments there had been determined the specific weights of the solvent liquids, the refractive index, the dielectric constant, and, in a number of cases, they had computed for the first time the dipole moment.

With such inductive charts it was possible to find out with only three experiments, which was the area of highest solvent activity and where the area of least solvent activity was located, the latter being as important as the first. He expressed the view that there could be no quantitative theory of solubility phenomena which did not take into consideration such results as he had indicated in his tables and charts. Although the latter might seem somewhat complicated at first the results were more or less easy to summarise. From an examination on the charts of the area of greatest activity which was surrounded by an area of less activity and then an area of inactivity it was possible to determine when to stop working and when to go ahead, and in that way it would make it easier for the practical chemist to find the solvents he wanted.

Tributes to the Lecturer

DR. W. CLAYTON, in an expression of appreciation of the lecture, said he was very gratified that as a visitor he should have been given the opportunity of saying a few words about Dr. Ostwald. Professor Donnan had mentioned that Dr. Ostwald bore a name already well known in physical chemistry and how he was ably carrying on the tradition associated with that name. Not only did they recognise Dr. Ostwald as one of the leading exponents of colloid chemistry in Germany, but he had done a great deal for the science since 1907, when he assumed the editorship of *Kolloid Zeitschrift* and *Kolloid Beihefte*, and it was remarkable that these journals had grown steadily in size and importance and international character ever since that time. The lecture that evening had reminded him of the fact that Professor Ostwald was a vigorous exponent of the autonomy of colloid systems. Professor Ostwald's work, however, was not confined to the subject on which he had just lectured to them and few issues of

Kolloid Zeitschrift were published without a paper from his celebrated school and colleagues. Professor Ostwald had covered the whole range of modern colloid chemistry with his vigorous mind and his school was steadily sending forth to the Universities of Europe men eminently qualified to carry on the work which he himself had been so ably teaching.

DR. L. A. JORDAN, proposing a vote of thanks to Dr. Ostwald, said it was his privilege, and, indeed, he was most happy, to convey to him the cordial thanks of the meeting for his address. As Englishmen, he said, we believed in the collaboration of scientific men the world over as a necessary factor in the promotion of a lasting and fruitful peace and he was sure that this vote of thanks to Dr. Ostwald for his "teaching" that evening could rightly be interpreted as a demonstration of the sympathy with which we in England viewed the spirit of understanding.

DR. G. F. NEW, who seconded the vote of thanks, expressed the indebtedness of the Association to Dr. Clayton, through whose good offices they had had such a splendid lecture.

PROFESSOR OSTWALD, acknowledging the vote of thanks, said he knew he had friends here but did not know how many and how good they were. He supported, with the fullest respect, the last sentiment expressed by Dr. Jordan, that science has no boundaries and that goodwill between scientists ought to assist that goodwill between nations which it was so necessary should exist.

Safety Glass Patent Action

Midland Firm's Claim for Damages

THE hearing of an action for damages in respect of a safety glass patent began in the King's Bench on Tuesday before Mr. Justice Branson.

Plaintiffs were Gilt Edge Safety Glass, Ltd., of Stone, Staffordshire. Defendants were Mr. Granville Hugh Baillie, of Westminster, a consulting engineer; Pilkington Bros., Ltd., of St. Helens; Triplex (Northern), Ltd., of St. Helens; Mr. James Meikle, manager of Pilkingtons' works; Mr. Robert Francis Taylor, also employed by Messrs. Pilkington; Mr. Lewis Jex-Blake Forbes, manager of Triplex (Northern), Ltd.; and Mr. John Dennett, of Pilkington Bros. (Australia), Ltd. Damages were claimed against Pilkington Bros., Ltd., for alleged breach of contract and against the other defendants for alleged conspiracy. The defence was a denial of the allegations.

The case for plaintiffs was that in 1935 they desired to operate a certain process in the manufacture of "toughened" glass. To make sure that their process did not infringe any patent of Pilkingtons, it was decided that there should be a confidential inspection by Pilkingtons. That was done, and plaintiffs now alleged that Pilkingtons circulated information about the process to rivals, and that it found its way into the patent specifications of Pilkingtons. Plaintiffs alleged that they had suffered damages as a result.

The hearing of the case, which is expected to last about a fortnight, was continuing as we went to press.

While the output of many industries in this country has declined from the exceptional levels of 1937, the aluminium industry shows a further substantial advance over the 1937 level, according to the Aluminium Information Bureau. For example, the pig-iron and steel industries of the United Kingdom show decreases in production of about 18 per cent. in the first eleven months of this year as compared with the similar period of 1937, but the imports of bauxite are up by 18½ per cent. and imports of unmanufactured aluminium have increased by no less than 64 per cent. from 26,404 long tons to 43,413 tons. Home production was 19,000 long tons in 1937 and may be roughly estimated at 22,500 tons in 1938. Exports of aluminium from the United Kingdom on the other hand have decreased, indicating pressure of demand for the home market.

South African Chemical News

Discrimination Against British Chemical Products

From our Special Correspondent

THE representative of a leading Johannesburg firm has drawn attention to the exclusion in advance of British products from a tender calling for the supply of a quantity of pure chemicals for the Onderstepoort laboratories. On the tender form, as an introduction to the list of 144 chemicals, it is stated: "All chemicals on this list must be the products of either or of all the following firms." Two of the firms named are in Berlin, and the other in Darmstadt, Germany. This tender was advertised in the Government Gazette, and representatives of British firms cannot understand why they have not even been allowed to quote prices. British firms could have supplied most of the products required, and whether they would have been more expensive or cheaper than the German manufactures is beside the point. The fact remains that irrespective of price, no firm outside three German concerns is to get the contract. It is being wondered whether this practice of discrimination against British goods is to continue.

Home-Produced Barytes

Another indication of the Union's rapid industrial progress is the effort being made to produce all the country's requirements of barytes at Germiston. Ground barytes is made in the Union and sold chiefly to paint manufacturers, but it is also used in the paper, rubber, linoleum and textile industries. Lithopone, of which barytes forms about 70 per cent., is being used as a white pigment and barium chemicals have many important uses in South African industry. Crude barytes is found in the Postmasburg district of the Cape Province; from there it is railed to Germiston, where it is processed. At present two colour grades are produced—grey and mid-white—but the bleached, super-white grade is also to be manufactured in the near future.

South African Alkali Profits

The accounts of South African Alkali, Ltd., for 1937-38, show a profit of £6,996, as compared with £4,767 in the previous twelve months. After providing £7,049 for depreciation, the balance unappropriated decreases from £1,657 to £1,604. A dividend of 5 per cent. had been paid in the previous year. During the current year the construction of a plant to extract soda ash and salt from the saltpan mud will be started. This plant will enable production to be maintained at a constant rate throughout the year, and extend the life of the pan.

Production of Fish Meal and Oils

The Government believes there are numerous possibilities in South Africa for the manufacture of fish meal for animal feeding, especially as South African animals need a feed that will compensate for the low phosphorus content of South African soils. An effort will be made to encourage the use of fish meal as a cattle food. It is also claimed by the Government that shark liver oil is a proved substitute for cod liver oils and that the practicability of extracting oils from the liver of other kinds of fish should be investigated, especially with a view to determining vitamin content. The production of such oils, and of by-products like fish glue, may be undertaken with the production of fish meal, so ensuring large scale production and continuous working which will only be possible when supplies are sufficient. Sites for crawfish canning factories have been suggested and for factories for making fish fertiliser, dried, salted and smoked fish. Thorough investigation of the position in Natal is recommended, for there millions of fish fry are killed by pollution of the rivers with the waste products from the sugar factories.

Letters to the Editor

The Administrative Chemist

SIR,—I read your article in your issue of January 14 entitled "The Administrative Chemist" with considerable interest. In that article the point was made that the standards required of the chemist were too high and that in order to fulfil them the student would have little time to take notice of anything outside his own course of study and so attain that broadening of mind and knowledge of men so essential in the administrator. An article contributed to the current issue of the Journal and Proceedings of the Institute of Chemistry draws attention to the fact that all industries and every department of life are dependent in some degree upon science. The scientist, therefore, has unique responsibility and must possess the objective outlook and administrative or executive ability in order to discharge his responsibility. The author of the article makes the point that science may, by its very nature, tend to unfit many of its students for ordinary administrative positions; it provides little scope for acquiring the knowledge of men so essential to administration. The danger of early specialisation is emphasised, and it is suggested that the chemistry course at the University should be lengthened and this would also have the additional advantage of allowing for the introduction of one or more additional subjects. Broadening of the mind and knowledge of world affairs should be obtained by foreign travel.

As to the lengthening of the degree course, and of taking one or more subsidiary subjects during it, the plan sounds very fine in theory but it would surely be inoperative in practice. The lengthening of the course beyond four years would be a very hard financial burden for the student to bear, and would it not be a retrograde step to reintroduce one or more additional subjects in the course? The practice has been in the Universities in comparatively recent times to devote less and less time to any subsidiary subject and to give the student the maximum possible time for chemistry. "Special" degree courses were instituted for the very purpose of eliminating what were considered to be unnecessary subjects in the "general" degree. After all is said and done what the chemical industry requires is as good a chemist as possible. The more practical and theoretical chemistry that the student can absorb during his time at the University so much the better, and chemistry courses are, as they should be, designed for the production of the most highly trained chemist possible, with the avoidance of "smatterings" of other subjects.

It must surely remain for the individual to decide in which direction his bent lies. If he feels that he has the quality of leadership in him then he must cultivate for himself a wider knowledge of men and affairs. Character and personality, in the formation of which heredity is a factor, are moulded generally before the University is reached, and these two qualities are as important as any in fitting a man for administration. No graduate on leaving the University can possibly expect to step straight into an administrative position. So let him be a chemist first and if he is "plus a little something some others have'nt got" leadership will follow almost automatically.—Yours faithfully,

London, AN OLD SUBSCRIBER.
January 16.

The Five Day Week

SIR,—The five day week was introduced to Crimscott Street factory on November 25, 1927, and to Silvertown factory on November 16, 1931. Previously we worked 3¼ hours on Saturday morning to complete the 47 hour week. On commencing the five day week, we extended the hours on each of the first four days of the week by ¾ hour, and by ¼ hour on Friday. As we allow 10 minutes during each morning and each afternoon for rest, and 10 minutes daily for official starting and finishing, making a total of ½ hour daily, the actual net working hours are reduced to 9 hours on each of the first four days and 8½ hours on Friday. We find that the fixing of definite allowed time, lends itself to more economical usage, than was our experience prior to the recognition of definite allowed time.

The advantage which has resulted from the introduction of the five day week, is an economy in steam production and heating, there is a slight set-off on the other side on increase in lighting during certain months of the year, which is minimised by the discouragement given to overtime owing to the slightly longer days.

Saturday morning was largely a cleaning up day, which lent itself to an earlier start than was at times necessary, the time for actual production was relatively small, and was therefore uneconomical. With the introduction of the five day week, cleaning up on Friday evening tends to be confined to a much shorter time.

Timekeeping records and consequent clerical work is also reduced.

It has been observed that the longer day discourages overtime, partly because there is a dislike on the part of personnel to work exceptionally late, and partly because the longer day lends itself to better planning. On the other hand in times of real pressure Saturday morning is available for overtime, when actual serious production can be carried out to the fullest, Friday evening still remains the cleaning up period instead of Saturday.

There is also the advantage of utilising Saturdays for overhaul of plant as required, and a consequent reduction in Sunday labour. Those workpeople who live at a distance are saved the expense and time of travelling on a sixth day.

All workpeople have the advantage of the longer week-end rest, and it was noted after its introduction that absenteeism tended to reduce. This week-end advantage is particularly noticed at the time of the annual holiday as it provides nine clear days holiday.—Yours faithfully,

CROSSE & BLACKWELL, LTD.

Crimscott Street Factory,
Bermondsey.

SIR,—We instituted a five day week on April 1, 1935, and have been running it ever since, and while no actual records have been kept we have found the following advantages and disadvantages:—

Advantages.—There has been a definite reduction on charges for power, lighting and heating of nearly 5 per cent.

Production has been maintained at a steadier flow, due to less machine stoppage owing to breakdown, as all machines are periodically overhauled on Saturday morning. The hours worked in the despatch section are arranged to obtain the fullest utilisation of time during rush periods of the day or week.

Customers' complaints of late delivery have practically ceased, as *all* orders are cleared each Friday night, which necessitates despatching the majority of orders the day they are received.

Further, we consider that the nature of our business imposes considerable nervous strain on the executives, and the long week-end away from the business, with the knowledge that the whole firm is shut down, has caused a definite improvement in health and less nervous disorders.

Disadvantages.—Rush periods in the order and despatch departments on Monday morning and Friday night are aggravated, and special steps have had to be taken to deal with them.

Contact between home travellers and head office has been lost as meetings were held on Saturday morning and the various executives were at the office to settle any particular queries. Now contact at the office is only made between southern area travellers and the area manager one Saturday per month.

Absenteeism in the order department where nervous

strain is prevalent, has not decreased to any extent, as it has been found necessary to have members of this department at work one Saturday morning in four.

It has come to our notice that some of the girls have used their Saturday to obtain employment at multiple stores as temporary hands for which we understand they receive 5s. for serving at the counters from 2 p.m. to 9 p.m., also there is some apathy to the Saturday morning among the younger girls who would rather come out to work than do housework at home.

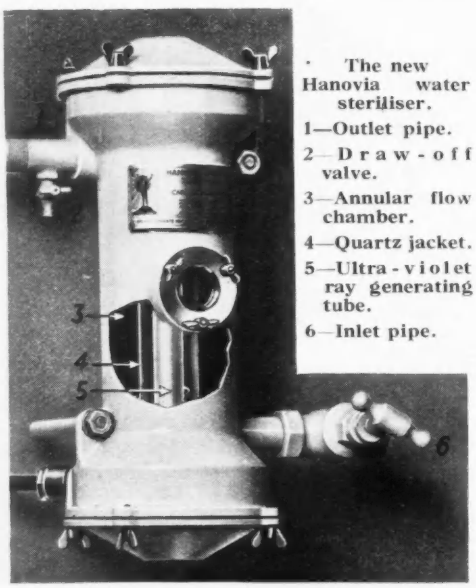
In conclusion we would say that the five day week is generally appreciated and after a three year trial we have no thought of reverting to Saturday morning work.—Yours faithfully,

Great West Road, Brentford, Middlesex — MACLEANS LTD.

New Water Steriliser

Ultra-Violet Ray Apparatus Introduced by Hanovia, Limited

CHLORINATION, ozonisation, and other chemical methods of water sterilisation commonly used all have the disadvantage that they may alter the taste and chemical composition of the water and need to be carefully steered between the two extremes when they neither destroy the bacteria in the water on the one hand, nor injure the consumer on the other. For some purposes (for example, the cleansing of bottles and containers for milk, etc.) the use of chlorinated water is not permissible. The sterilisation of water by passing ultra-violet rays through it (after preliminary filtration) has long been known and extensively used, but has suffered from certain drawbacks inherent in the apparatus. It was hitherto necessary to use quartz mercury arc burners of complex shape, cumbersome and fragile to handle, capable of operating only in the horizontal position, and requiring hand-tilting to start.



The new Hanovia water steriliser.
1—Outlet pipe.
2—Draw-off valve.
3—Annular flow chamber.
4—Quartz jacket.
5—Ultra-violet ray generating tube.
6—Inlet pipe.

In the Hanovia water steriliser now announced, all these drawbacks are said to be overcome. The quartz mercury arc tube used acts on the new high pressure electronic discharge principle, operates in any position, is very simple in shape, and starts automatically. It is surrounded by a quartz jacket, which in turn forms the core of a well-designed metal container. The water for treatment, after being clarified in a filter, is admitted at the base of the container and flows in an upward swirl around the annular flow chamber in a layer 1 in. thick. The chamber has a height of 7 in. and a capacity of $2\frac{1}{4}$ pints. The steriliser is designed to give an output up to 600 gallons per hour so that normally the water is exposed for $1\frac{3}{4}$ seconds. While this rate of flow can be reduced to any point desired, it has been found by extensive bacteriological tests that pathological organisms such as B.coli, the typhoid bacillus, soil bacilli, etc., are destroyed even in heavy concentrations at this rate of flow. Other injurious organisms, for example, the acidifiers and proteolytes which produce rancidity in butter, the sarcina, lactic and acetic acid-producing organisms detrimental in brewing, are likewise destroyed. The unit has been subjected to thorough investigation, and advance models have shown their practical value in breweries, butter factories, mineral water plants and specialised branches of industry.

The Hanovia water steriliser is a compact unit which occupies under 2 cu. ft. of space when mounted complete on a wall. It consumes only 0.7 kW of electricity on a standard A.C. supply. Particulars will readily be furnished by Hanovia, Ltd., of Slough, or by any of their agents.

Dry Pressing in Ceramic Moulding

Conditions Producing Highest Apparent Density or Lowest Apparent Porosity

THE possibility of utilising dry pressing for the satisfactory moulding of ceramic materials has been investigated by Dodd (*Bull. Amer. Ceram. Soc., 17,* 465-477). The object of the investigation was to discover the conditions under which the highest apparent density or lowest apparent porosity may be obtained by dry pressing. It is considered preferable to measure the porosity rather than the bulk density, as the former may be expressed in larger figures, and is therefore a more sensitive index, also there are occasions when the bulk density is not at a maximum when the apparent porosity is at a minimum.

The ceramic mixes were ground to pass 8-mesh, and then formed under loads of 500 and 2,000 pounds per sq. in. The minimum porosity with relation to the amount of grog in the mix was attained when the percentage of this ingredient was 50. Increase in the size of the grog grains reduced the porosity of the unfired blocks containing from 30 to 70 per cent. of clay, the forming pressure being 500 pounds. A similar effect is produced by increase in the size of the clay grains. As to the water content of the mix, the optimum amount was found to be 6-10 per cent. on a dry basis. Ageing of the tempered mixes for dry pressing up to 100 days had little effect on the porosity of the resulting blocks.

The forming action of the pressure in the mould appears to cease after two seconds; no decrease of porosity was noted after that time. The porosity itself is inversely proportional to the applied pressure between 500 and 2,000 pounds per sq. in.

The application of a vacuum to the mixes before forming to get rid of entrained air, had the effect of producing a block with slightly higher porosity, and one in which the transmission was not so uniform.

An attempt was made to improve the uniformity of distribution of pressure in the mould by adding to the dry mix 8 per cent. of 0.1 N ammonium chloride, and passing a direct current of 7 amps. from the mix to the mould box, preferably from two plates equally spaced in the mix. This was found to produce a very uniform pressure transmission, but it did not in all cases result in the maximum bulk density being attained.

MANUFACTURE of plant-protective agents on the basis of copper oxychloride will be greatly expanded in Italy on completion of new plants which are to be constructed by the Montecatini concern at Piano d'Orta (Pescara), and by the firm of Mario Puccioni fu Cesare, at Castellina (Chianti)

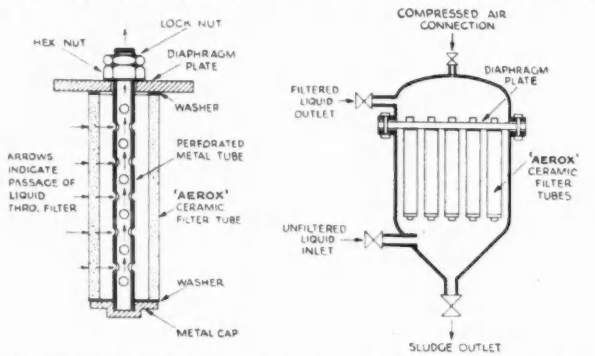
Ceramic Filters

A New Range of Wide Application

A NEW range of porous ceramic filtering materials has been introduced by Aerox Filters, Ltd., of Glasgow. These ceramic materials are resistant to corrosive fluids and are made with a pore size ranging from below one micron up to several hundred microns, distribution of pores and pore density also being exactly regulated. The materials are produced in a great variety of shapes—they can be sawn, cut or ground to suit individual requirements—while their mechanical strength and durability are very high.

Aerox filter materials are of three distinct types: quartzite, biscuit porcelain, and diatomaceous or kieselguhr bodies. Quartzite filters, the usual forms of which are square or circular tiles in varying thicknesses and sizes and hollow cylinders from 2 in. to 6 in. in diameter and up to 24 in. long, are produced in several grades, varying from coarse-grained bodies of extreme permeability, down to a close-grained type. The latter has a pore size of as low as 10 microns, but is at the same time of such high pore density that it ensures rapid permeability. The high rates of flow obtainable with these filters is exemplified by the P27 grade which gives a flow of 1,700 gallons of water per square foot per hour at 5 lb. pressure.

Quartzite filters are thus particularly suitable for industrial filtering and aerating operations of both liquids and gases, especially where resistance to corrosive fluids is essential.



An example of one type of plant supplied by Aerox Filters Ltd. Left: a cylinder type ceramic filter. Right: section of a filter vessel.

They have a further useful application in reactions between liquids and gases by presenting the gaseous reactant in the form of minute bubbles, thus giving the maximum surface for reaction.

Biscuit porcelain is used in filtering operations where it is necessary to separate extremely minute particles, frequently of colloidal dimensions, from acidic or other corrosive liquors. The biscuit porcelain manufactured by Aerox Filters, Ltd., resembles porcelain in colour and composition, but differs from it in that it is highly porous. Its pore dimension can be regulated in size over a range of from 10 to 15 microns, down to below 1 micron. The nature of its ingredients, and the temperature at which it is fired, ensure resistance to acids on the one hand (in the case of the more siliceous bodies) or to caustic alkalies on the other (where the alumina content preponderates). Aerox biscuit porcelain is also used for electrolytic processes in the form of closed cells or thin plates, and has been successfully employed in the filtration of oils, concentration of rubber latex and many similar operations, which demand minute pore size with high pore density.

Diatomaceous or kieselguhr bodies, while less resistant to corrosive chemicals than either biscuit porcelain or quartzite, combine small pore size with high permeability and are used for the filtration of neutral, or nearly neutral, liquids containing solids of colloidal dimensions. Kieselguhr filters are usually employed in the form of candles or hollow

(*Continued at foot of next column.*)

Paper Filling and Sizing Materials

Their Effect on the Stability of the Product

THE effect of filling and sizing materials on the stability of book papers has been studied by Shaw and O'Leary (*Bureau of Standards Journal of Research, 21*, 671-695). The papers were prepared from representative rag and sulphite-soda stocks, and also from three purified wood pulps. Four types of filler were studied: titanium oxide, zinc oxide, chalk (both precipitated and finely ground natural white), and clay. The sizing agent employed was rosin soap precipitated by means of aluminium sulphate (papermaker's alum). Altogether 72 papers were manufactured in a semi-commercial mill, and extensive physical and chemical tests were made on them before and after an accelerated ageing treatment consisting of heating the paper at 100° C. for 72 hours.

The effect of increasing filler content is to reduce the strength of the paper quite independently of its chemical nature. Thus the use of high capacity fillers, such as TiO_2, ZnS, and even chalk, is preferable to clay. There was no pronounced difference in the effect of the non-alkaline fillers on the degree of sizing; they were inferior to chalk in reducing the degree of sizing necessary. Papers made with the latter material were sized sufficiently for printing.

The maximum clay retention in the case of wood and rag stocks was obtained when the *p*H of the head box was 5, decreasing as more alum was added, *i.e.*, as the stock became more acid. In the case of sulphite-soda papers, the retention of non-alkaline fillers increased with the amount of alum added.

Rag and wood papers were found in general to be more stable to heat than sulphite-soda, and non-alkaline fillers had no harmful influence on the stability of papers made from these stocks; indeed, chalk has a protective effect.

It appears that the acidity of the stock is an important factor in the deterioration of the resulting papers; it is desirable to use as little alum as possible, since the attack on cellulose was found to increase directly as the amount of alum used increased, both in sized and unsized papers.

NEW FELLOWS OF INSTITUTE OF PHYSICS

At a meeting of the Board of the Institute of Physics held last week the following were elected to the Fellowship:—A. Bloch, M.Sc., Dr.-Ing.; W. Bowen; J. A. Darbyshire, M.Sc., Ph.D., D.I.C.; N. A. Esserman, B.Sc.; J. W. Illingworth, M.Sc., Ph.D.; M. S. Pirani, Dr. Phil; N. R. Tawde, B.A., M.Sc., Ph.D.; W. R. Thomas, M.Sc., Ph.D; H. Walke, M.Sc., Ph.D.; H. W. H. Warren and E. J. Williams, B.Sc., Ph.D.

(*Continued from previous column.*)

cylinders of small diameter, closed at one end, or with both ends open, up to a length of 12 in.

Aerox Filters, Ltd., in addition to manufacturing filtering media also supply complete filter plants. These plants are designed on simple lines for ease and rapidity in removing the filter when necessary. The filters are positively fixed, allow the maximum filtering area and are constructed to maintain the heavy duties of every day working conditions. The customer is advised on the grade of filter best suited to his requirements. The illustration shows an example of one type of plant. On the left is a cylinder type ceramic filter fitted to a diaphragm plate, suspended on a central metal tube suitably perforated to allow free passage of filtered liquid. This type of ceramic cylinder is open at both ends. On the right is shown a section of a filter vessel showing various pipe connections and diaphragm plate fitted with filters.

Aerox Filters, Ltd., also manufacture plant for the separation of oil from water in boiler feed systems; their London depôt is now open at 11 Amersham Road, New Cross, S.E.14.

British Overseas Chemical Trade in December

ACCORDING to the Board of Trade returns for the month ended December 31, 1938, imports of chemicals, drugs, dyes and colours were valued at £930,962, a decrease of £265,747 as compared with December, 1937. Exports were valued at £1,637,748, as compared with £1,843,089, a decrease of £205,341. Re-exports were valued at £38,692. Total imports for the year were valued at £13,214,627, as compared with £13,857,534 in 1937, a decrease of £642,907, and exports decreased by £2,604,414 to £22,048,681. Re-exports increased by £6,370 to £471,668.

Imports

	Quantities, December 31		Values, December 31	
	1937.	1938.	1937. £	1938.
Acids—				
Acetic .. .. cwt.	22,254	11,689	26,308	14,439
Boric (boracic) .. ,,	3,650	3,406	4,189	3,771
Citric .. .. ,,	1,337	1,920	5,350	7,911
Tartaric .. ,,	4,067	1,050	18,051	4,919
All other sorts .. value	—	—	6,472	10,458
Borax .. .. cwt.	21,587	18,430	13,584	11,919
Calcium carbide	121,168	114,332	69,266	51,775
Fertilisers, manufactured—				
Superphosphate of lime tons	2,838	1,133	6,641	2,221
All other descriptions ,,	2,091	3,209	13,390	15,887
Potassium compounds—				
Caustic and lyes cwt.	13,246	8,764	12,801	9,055
Chloride (muriate) ,,	69,188	70,451	24,648	24,702
Kainite and other potassium fertiliser salts cwt.	47,024	42,956	8,401	7,592
Nitrate (saltpetre) ,,	4,916	1,565	4,444	1,532
Sulphate	34,104	9,086	16,000	4,268
All other compounds ,,	10,101	4,602	13,295	6,734
Sodium compounds—				
Carbonate, including soda crystals, soda ash and bicarbonate cwt.	269	104	293	235
Chromate and bichromate .. .. cwt.	4,427	1,249	4,777	1,659
Cyanide	—	1,620	—	3,488
Nitrate .. .. ,,	70,835	98,099	16,255	23,903
All other compounds ,,	20,618	15,518	22,140	8,001
Chemical manufactures value	—	—	316,510	240,940
Drugs, medicines and medicinal preparations—				
Quinin and quinine salts .. oz.	116,776	116,878	9,679	10,120
Medicinal oils .. cwt.	3,505	4,700	9,848	13,915
Proprietary medicines value	—	—	108,356	64,634
All other sorts .. ,,	—	—	49,902	54,904
Finished dye-stuffs obtained from coal tar cwt.	5,629	3,230	175,566	101,987
Extracts for dyeing ,,	4,513	3,318	7,743	7,601
Extracts for tanning—				
Chestnut .. cwt.	39,228	26,536	26,193	19,161
Quebracho .. ,,	16,418	15,038	14,794	13,680
All other sorts .. ,,	46,861	66,125	39,881	60,651
All other dyes and dye-stuffs .. .. cwt.	1,123	543	16,469	11,735
Painters' and printers' colours and materials—				
White lead (basic carbonate) .. cwt.	5,122	3,996	7,424	5,453
Lithopone	30,309	26,605	18,826	16,914
Ochres and earth colours cwt.	36,233	18,007	11,918	7,657
Bronze powders and other metallic pigments .. cwt.	1,749	1,282	12,700	10,449
Carbon blacks .. ,,	30,557	32,910	46,744	46,211
Other pigments and extenders, dry cwt.	36,037	30,415	10,010	6,931
All other descriptions ,,	13,603	11,758	27,850	25,440
Total .. .. value	—	—	1,196,709	930,962

Exports

	Quantities, December 31		Values, December 31	
	1937.	1938.	1937. £	1938.
Acids—				
Citric .. .. cwt.	1,632	1,471	6,042	6,596
All other sorts .. value	—	—	23,420	22,115
Aluminium compounds tons	2,970	1,838	35,844	15,495
Ammonium compounds—				
Sulphate .. tons	26,603	27,703	174,207	180,811
All other sorts .. ,,	1,162	576	16,596	12,150
Bleaching materials—				
Bleaching powder (chloride of lime) .. cwt.	71,924	46,999	18,255	13,256
All other sorts .. ,,	5,963	4,989	12,967	12,162
Coal tar products—				
Cresylic acid .. galls.	158,167	188,475	27,969	18,584
Tar oil, creosote oil ,,	2,543,246	2,174,290	64,140	42,184
All other sorts .. value	—	—	21,195	8,039
Copper, sulphate of tons	1,447	1,715	24,654	30,265
Disinfectants, insecticides, etc. .. .. cwt.	32,319	30,986	65,941	58,849
Fertilisers, manufactured tons	26,866	10,893	60,679	44,291
Glycerine .. .. cwt.	8,916	8,878	37,523	33,548
Lead compounds .. ,,	13,005	9,775	19,442	14,649
Magnesium compounds tons	380	403	9,406	10,107
Potassium compounds cwt.	5,840	2,661	10,300	7,664
Salt (sodium chloride) tons	23,654	13,740	60,916	41,229
Sodium compounds—				
Carbonate, including soda crystals, soda ash and bicarbonate cwt.	302,624	253,435	71,723	58,436
Caustic .. .. ,,	168,564	118,924	94,010	63,526
Nitrate .. .. ,,	749	7,124	324	2,472
Sulphate, including saltcake .. .. cwt.	92,472	13,691	8,866	1,975
All other sorts .. ,,	62,921	55,369	75,802	68,128
Chemical manufactures and products .. value	—	—	24,131	24,021
Drugs, medicines and medicinal preparations— value	—	—	11,403	12,904
Zinc oxide .. tons	989	765	21,284	13,853
All other descriptions value	—	—	188,062	204,660
Drugs, medicines and medicinal preparations—				
Quinine and quinine salts .. .. oz.	76,044	62,343	8,894	7,960
Proprietary medicines value	—	—	137,721	110,235
All other descriptions value	—	—	145,163	144,865
Dyes and dye-stuffs and extracts for dyeing and tanning—				
Finished dye-stuffs obtained from coal tar—				
Alizarine, alizarine red and indigo (synthetic) cwt.	940	740	8,492	7,607
Other sorts ,,	5,977	5,502	74,758	92,924
Extracts for tanning ,,	14,707	17,216	12,716	16,439
All other descriptions ,,	1,738	1,559	9,977	8,158
Painters' and printers' colours and materials—				
Ochres and earth colours cwt.	9,598	8,052	10,517	8,596
Other descriptions ,,	17,568	11,307	34,474	25,093
White lead .. ,,	3,375	4,805	7,278	9,123
Ships' bottom compositions cwt.	2,516	2,017	8,881	7,119
Paints and painters' enamels .. .. cwt.	37,274	35,912	110,534	101,127
Varnish and lacquer (clear) .. galls.	66,528	49,916	26,247	20,634
Printers' ink .. cwt.	4,158	3,311	21,731	20,600
All other descriptions ,,	39,451	39,430	77,629	72,404
Total .. .. value	—	—	1,843,089	1,637,748

Re-Exports

	Quantities, December 31		Values, December 31	
	1937.	1938.	1937. £	1938.
Dyes and dye-stuffs and extracts for tanning cwt.	866	503	956	2,286
Painters' and printers' colours and materials cwt.	749	180	1,351	381
Total .. .. value	—	—	37,841	38,692

Personal Notes

MR. HERBERT ARUNDEL, retired research chemist, of Nobel's, Ardeer, Ayrshire, left estate valued at £4,267.

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MR. ERIC JOHN RALLI ROBERTSON, of Ilkley, Yorks., master dyer, left estate valued at £12,245 (net personalty £10,557).

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DR. HENRY DREYFUS, chairman and joint managing director of British Celanese, Ltd., received the Perkin medal of the Society of Dyers and Colourists in Bradford on Thursday. Famous as an authority on cellulose acetate, Dr. Dreyfus is the 11th recipient of the honour which was instituted in 1928. A member of a well-known family of chemical manufacturers in Basel, where he studied chemistry at the University, he took a post-graduate course in Paris and was awarded his doctorate in 1905 for work connected with the synthesis of indigo. He later investigated the synthesis of alkaloids and

Dr. Henry Dreyfus.

perfumery products. Experiments with cellulose acetate and nitrocellulose in which he worked with his brother, Dr. Camille Dreyfus, resulted in the invention of non-inflammable celluloid and films. During the war the committee examining the question of the use of cellulose acetate dope for the fabric of aeroplane wings, etc., advised the use of the Dreyfus process, with the result that the Spondon works, near Derby, were built and production carried out under the personal supervision of Dr. Dreyfus. For his work for the French Government in this connection he was created a Chevalier of the Legion d'Honneur and promoted to Officer of the Legion about a year ago. After the armistice, Dr. Dreyfus made cellulose acetate artificial silk at the Spondon works and called his product "Celanese."

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LORD WILLINGDON, who was successively Governor-General of Canada and Viceroy of India, has consented to preside over the annual banquet of the Boys Hostels Association. This function, the twelfth of a notable series, will be held on Thursday, April 27, at the Dorchester Hotel, W.1. LORD LEVERHULME, the President of the Association, in making this announcement, expresses his confidence that the dinner will maintain the high tradition established by his predecessor, SIR ERNEST BENN. Lord Leverhulme also announces that SIR JOHN ANDERSON, M.P., Lord Privy Seal, has promised to be the chief speaker at the dinner if his public duties permit. MR. REGINALD MCKENNA, the honorary treasurer of the Association, hopes to attend and speak, and the toast list will include, as invariably in the past, the name of the headmaster of one of the great public schools.

MR. JAMES N. NICHOLSON, divisional manager, was made a presentation on Tuesday by the staff of Imperial Chemical Industries, Ltd., Glasgow, on the occasion of his retirement after 47 years' service.

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MR. PETER F. BENNETT, a director of Imperial Chemical Industries, Ltd., who is president of the Federation of British Industries, has been nominated by the Grand Council of the Federation for a second term of office.

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MR. BLOOMER, the managing director of the Widnes Soap Co., has been nominated to succeed Dr. P. H. Wigner on the executive council of the Widnes Chamber of Commerce, as one of the representatives of the manufacturers.

* * * *

SIR WILLIAM JOHN JONES, a director of the British Refractories Research Association and during the war a director of refractory materials and deputy controller of steel production, left estate valued at £76,132 (net personalty £71,000).

OBITUARY

MR. JOHN DONINGTON CAMPBELL, chairman of J. C. and J. Field, Ltd., soap and candle manufacturers, has died at the age of 69.

* * * *

MR. ROGER WILD, formerly managing director and secretary of Wrose Hill Fire Clay Co., Ltd., who founded the firm about 40 years ago, has died at the age of 73.

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MR. ROBERT SCOTT, director of C. H. Handasyde and Co., Ltd., Abercorn Oil Works, Paisley, with which firm he had been connected for 70 years, died last week at the age of 83.

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M. HENRI RAYMOND VIDAL, who was awarded the Perkin Medal of the Society of Dyers and Colourists in 1919 and also appointed an honorary member of the Society for his work on sulphur dyestuffs, has died in Paris at the age of 76.

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DR. A. W. PORTER, F.R.S., Emeritus Professor of Physics in the University of London since 1928, died at West Kirby, Wirral, last week. He was a founder member of the Faraday Society and was president from 1920 to 1922. He was a prominent worker in connection with X-rays.

TO-DAY'S ANNIVERSARY

JOSEPH ACHILLE LE BEL, born on January 21, 1847, contributed new theories for the explanation of special cases of geometrical isomerism. He became assistant to Balard, the discoverer of bromine, and later to Wurtz, who discovered the "compound ammonias" or amines, and he was able to devote himself to scientific investigations through the good fortune of inheriting a valuable petroleum property which he sold. Le Bel's published work is not extensive, but he had much originality of thought and it is said that those who gained his friendship also gained the help of a true philosopher. Stimulated by the need of accounting for the existence of optically-active isomers, almost simultaneously with van't Hoff, but independently, he helped in laying the theoretical foundation of "chemistry in space," which has now become known as stereochemistry. The conception that molecular structure is a matter of three and not only two dimensions, first visualised by Pasteur, was really developed into a consistent theory in 1874. It has since received ample confirmation, all compounds which contain at least one carbon atom to which four different atoms or groups are attached having been found capable of existing in optically-active forms. Le Bel, who grouped the atoms of such a structure at the corners of a tetrahedron, died in Paris in 1930.

NEW TECHNICAL BOOKS

AN INTRODUCTION TO INDUSTRIAL MYCOLOGY. By George Smith and Harold Raistrick. Pp. 302. London: Edward Arnold and Co. 16s.

This book is intended to assist those who are commencing the study of "moulds" rather than of fungi in general, and deals particularly with the fungi which are of importance in industry. The major portion of the book consists of descriptions and illustrations of most of the genera of moulds which are of regular occurrence in industrial products, with more detailed consideration of the genera which are of greatest importance. Laboratory methods and special mycological terms are explained for the benefit of those who have had no previous biological training. There are chapters devoted to classification, laboratory technique, industrial uses of fungi, etc. The book is illustrated with a large number of original photomicrographs, which, with few exceptions, are all at certain precise and selected magnification and are readily comparable one with another.

LABORATORY MANUAL OF ORGANIC CHEMISTRY. By Harry L. Fisher. Fourth edition. Pp. 412. New York: John Wiley & Sons. London: Chapman & Hall. 13s. 6d.

The author of this book was formerly instructor in organic chemistry at Columbia University, and the first edition published in 1920 was the outcome of ten years of laboratory teaching experience. In the present edition many minor changes in experimental procedures have been incorporated, together with changes in expressions, abbreviations, etc., all in accordance with better usage and the standards of the American Chemical Society. The book is divided into two parts, the first dealing with laboratory experiments and the second with organic combustions. Procedures for the preparation of nearly 80 compounds are given in detail, 12 preparations being new by reference to the previous edition. Included among these new preparations is furfuryl alcohol by Cannizzaro's reaction, Monastral Blue (copper phthalocyanine), and the new refrigerant dichlorodifluoromethane ("Freon"). There is also a brief outline for the preparation of the ancient dyestuff, Tyrian Purple, from *p*-toluidine in five stages.

A discussion of the Diels-Alder reaction, with the addition of maleic annydride to anthracene as an illustrative preparation, is timely. This reaction is one of the most interesting developments in modern organic chemistry as it forms new six-carbon cycles and can be used to determine the presence of the diene structure in new compounds of unknown constitution. (See general discussion by Backman, "Synthetic Organic Chemicals," December, 1937, published by Eastman Kodak Co.) In the second part of the book detailed procedures for the determination of carbon and hydrogen, nitrogen, and the halogens, sulphur and phosphorus, are preceded by a novel historical introduction of seven pages with numerous footnote references. Here there is a very useful chapter upon some common errors in the determination of carbon and hydrogen and how to avoid them. This information extends to four pages and is summarised in a form which will impress the reader, each statement having its appropriate reference to preceding pages in the text where greater details are given. Some of this information may be regarded as common-sense, but in view of the experience which the author has gained in a teaching capacity it appears that it is necessary to be recited. For instance, "The preheater should not be heated to such an extent that the glass tube melts; watch the temperaure." "See that the glass stoppers are properly greased; attach a piece of twine to prevent them from being blown out in case of excess of pressure." "Keep the stop cocks of the U-tubes in the drying train closed when not in use." This half of the book has been changed but little by comparison with previous editions. The absence of any reference to micro and semi-micro methods is explained by the author as being due to the fact that he has had no first-hand experience with them, and that macro combustions are still used wherever the most accurate results are needed.

RECENT TRADE LITERATURE

THE SHORTER PROCESS CO., LTD., have issued a circular dealing with a further development in the Shorter process for shaft hardening. Illustrations show that shafts of almost any length can now be treated by the Shorter system, which is a scientific method of flame hardening applied to cylindrical parts to resist wear. The company have also issued a list of machine parts which may be surface or flame hardened by the Shorter process.

For more than six years the C. L. BURDICK MANUFACTURING CO. have not altered the prices of their hygrometers although the prices of wages and materials have advanced substantially. They have during that time incorporated many improvements in the instruments, making them both more reliable and more robust. They are now increasing their prices as from February 1 next and a leaflet to this effect has been issued by the company. The prices of hygrostatic controls will remain as before.

In an ordinary pan evaporator sensitive liquors are subjected to a prolonged boiling which is very harmful to the quality of the product even if the temperature is reduced by operating under vacuum. THE KESTNER EVAPORATOR AND ENGINEERING CO., LTD., in leaflet No. 259, which supersedes their leaflet No. 222, claim that this can be overcome by using the principles of their patent film evaporator, the inherent advantages of which have enabled them to develop and perfect the special range of evaporators for handling sensitive liquors known as the Kestner Patent High Vacuum Multi-circulation Evaporators. The chief advantages are the extremely high rate of concentration and the short period of time the liquor is in contact with the heating surface.

S. HUBBARD, LTD., have issued their spring and summer 1939 colour card, dyed on woolfelt and also on strawgoods. The card embraces the thirty-three colours sponsored by the Millinery and Mantle Consultative Committee under the auspices of the British Colour Council, with the addition of nine fashion colours from the Textile Color Card Association of the United States. They have issued also a millinery trimmings card which gives suggestions of ribbon trimming contrasts to some of the colours shown on their standard colour card. The company, which is no longer associated with the Millinery and Mantle Consultative Committee under the auspices of the British Colour Council, has its own Colour Information Department which will continue to give information to the British hat and millinery trade. Some 10,000 colour cards have already been issued to the trade for the spring and summer 1939 season.

THE BRITISH THERMOSTAT CO., LTD., have issued the first of their new series of "Progress Sheets" which are intended to provide their customers with information concerning new products, changes in design and other matters in connection with automatic temperature control. Progress sheet No. 1 describes and illustrates motor-control panels and duct heaters and gives details of the Teddington AF expansion valves. Mention is made of the fact that in the machine shop of the company the section laid out for building motor control panels for refrigeration and air-conditioning plant has been considerably extended and a photograph is reproduced of a panel for multi-temperature refrigeration installation in a large municipal hospital. It comprises a three-phase contactor starter for the compressor motor with overloads on all three phases; three YM 2 Teddington thermostats; a YM 6 no-water switch and a PC high pressure safety cut-out. The duct heater illustrated is a large unit recently completed for building into the air duct of a large air-conditioning installation. It is fitted with Clayton-Still patent elements which consist of spiralised heater wire enclosed in a copper tube supported by porcelain insulating spacers. All Teddington AF expansion valves now have the seat diameter in hundredths of an inch stamped on the seat itself and marked on the carton in which the valve is despatched, as well as on the valve body.

General News—From Week to Week

VERDICTS OF "ACCIDENTAL DEATH" AND "DEATH BY MISADVENTURE" respectively were returned at an inquest held at Manchester last week on two employees who were overcome by hydrogen sulphide at the works of the British Dyestuffs Corporation, Blackley, Manchester.

AN ACCIDENT OCCURRED on January 12, at the Burnbank chemical works of William Forrest and Son, Ltd., glue and feeding meal manufacturers, Paisley, when two employees were scalded, one fatally, when steam accidentally escaped while they were cleaning the interior of a water-tube boiler.

AT A MEETING OF THE VALE OF LEVEN DISTRICT COUNCIL recently, a suggestion was made that the Calico Printers' Association, Ltd., should be asked the price they were prepared to accept for the Dalmanoch Printworks, Bonhill, Dumbartonshire, which have been idle for a number of years, in an endeavour to bring some new industries to the district.

THE STAVELEY COAL AND IRON CO.'S annual staff ball held in the Odeon Ballroom, Chesterfield, on January 6, was once more a very successful event. The company of over 350 included Mr. D. N. Turner (managing director), Mr. W. C. Macartney (Markham and Co., Ltd.), and Mr. H. H. Berresford (director and commercial manager).

LORD RIVERDALE, chairman of the Scientific and Industrial Research Council, stated at the annual dinner of the Society of Glass Technology last week that the latest figures showed that £6,000,000 worth of bottles were manufactured every year in this country. There was a great shortage of optical glass in the Great War, but there need be no fear of that in the future.

DR. W. H. J. VERNON, of the Chemical Research Laboratory, Teddington, delivered the opening lecture of the special programme for the spring term in the Heriot Watt College, Edinburgh, on January 13, his subject being "Some Aspects of Corrosion." He referred to recent developments at the Chemical Research Laboratory, Teddington, in the protection of magnesium alloys by selenium coatings, the suppression of attack by leaded petrol fuels on uncoated magnesium by the use of an inhibitor, the influence of movement of natural waters on rusting of iron, the influence of pressure, and the development of standard accelerated corrosion tests.

IN THE ANNUAL REPORT of the Chemical and Allied Trades Section of the Manchester Chamber of Commerce, mention is made of the usefulness of the export development register. This is a register of manufacturers who wish to increase the volume of their products disposed of in overseas markets and of merchants who are prepared to place their shipping experience and organisation at the disposal of manufacturers. This register is intended to provide the secretariat of the Chamber of Commerce with such general information as will enable them to put merchants and manufacturers in touch with one another. The response of members of the chemical section has so far been most encouraging, and it is hoped this new service may prove useful in increasing the export trade of the area.

PROOF IN THE £10,000 ACTION for damages raised against Mr. John Wauchope McLusky, general manager of the Corporation Gas Department, was at Paisley Sheriff Court last week, fixed to commence on March 3. The hearing of the evidence will probably last several days. The pursuer, Mr. Robert Maclaurin, technical chemist, Homesteads, Stirling, inventor of a low-temperature carbonisation process known as the Maclaurin process, claimed that the sum sued for was a very moderate estimate of his loss. His reputation, he averred, had been gravely damaged by the statements and reports of the defender, and the prospects of marketing the process had been seriously injured for the future. The defender, in his answers, stated that he had at no time used his influence unjustly to prevent the use of the process. He was, from the first, unfavourably impressed with the process as a means of producing gas, and had the process been commercially sound, which it was not, the defender would have no hesitation in recommending its use by Glasgow Corporation for the purpose of producing fuel for domestic consumption. He and other servants of the Corporation used all their endeavours to make a commercial success of the process without success. His reports and documents were true, and were honesty and properly made by him in the discharge of his duty to the Glasgow Corporation.

ACCORDING TO THE BOARD OF TRADE JOURNAL, the "Moniteur Belge" of January 7 contained a decree which subjects to licence the importation into Belgium of caustic potash (crystallised or refined), Tariff No. 308, and caustic potash lye, Tariff No. 309.

IT IS ESTIMATED THAT THE WORLD CONSUMPTION OF RUBBER IN 1938 was between 905,000 and 910,000 tons, compared with 1,094,000 tons in 1937. Of the total decline of nearly 190,000 tons, 132,400 tons, or about 70 per cent., is attributable to American recession.

A £60,000 FACTORY with a floor space of 86,000 square feet is in course of erection on the Scottish Industrial Estate at Hillington. The factory will be the biggest on the Estate, and will be occupied in mid-July by Kelvin, Bottomley and Baird, Ltd., manufacturers of scientific, navigational, electrical and engineering instruments.

THE ANNUAL STAFF DANCE OF THE NATIONAL FIRE PROTECTION CO., LTD., was held at the Castle Hotel, Richmond, on Friday, January 13. The event was attended by a large number of employees and their friends, the superstitious of whom had to brave the terrors of ladders across doorways and an open umbrella which decorated the wall. Among the entertainment provided was a sketch in which the managing director of the company, Lieut.-Commander C. B. Sanders, took part.

THE MERGING OF THE INTERESTS OF THE SILK AND RAYON INDUSTRIES in one big central organisation in a drive for trade, is envisaged in proposals to be submitted to member firms at the annual meeting of the Silk Association at the Midland Hotel, Manchester, on January 24. It is believed that if silk and rayon producers can approach the Government with a united voice as the cotton industry is doing, they will stand a much better chance of a hearing. Flooding of the home market with cheap imported goods and the special difficulties exporters are meeting in competition with the totalitarian countries in particular are cited as two main reasons why strong organisation is needed. A most significant reform is the proposal to change the name of the Association to the Rayon and Silk Association.

A REPRESENTATION HAS BEEN MADE TO THE BOARD OF TRADE under Section 10 (5) of the Finance Act, 1926, regarding maleic acid and maleic anhydride. Section 10 (5) of the Finance Act, 1926, is as follows:—"The Treasury may by order exempt from the duty imposed by Section one of the Safeguarding of Industries Act, 1921, as amended by this Act, for such period as may be specified in the order, any article in respect of which the Board of Trade are satisfied on a representation made by a consumer of that article that the article is not made in any part of His Majesty's dominions in quantities which are substantial having regard to the consumption of that article for the time being in the United Kingdom, and that there is no reasonable probability that the article will within a reasonable period be made in His Majesty's dominions in such substantial quantities." Any communication should be addressed to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George Street, London, S.W.1, before February 16, 1939.

THE NATIONAL PHYSICAL LABORATORY has issued the second of a series of annual booklets (H.M. Stationery Office, 1s. net) giving abstracts of all papers contributed by the Laboratory to the scientific and technical Press or issued as official publications. The demand for the first pamphlet, dealing with the papers published in 1936, indicates that the concise summary of the completed work of the Laboratory so provided has proved of value to industry and to scientific workers. In addition to these annual compilations of abstracts, monthly lists of titles of current papers are issued, with the object of enabling industrial bodies to utilise the work of the Laboratory as soon as the results are available. It may again be emphasised that the main purpose of the Laboratory is to assist British industry, by affording information on technical problems, by undertaking tests of instruments and materials, and by carrying out researches for the advancement of industry. Opportunities of advising British firms on technical matters within the scope of the Laboratory are welcomed, and no fee is charged unless experimental work is undertaken at the request of a firm.

Inventions in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Applications for Patents

PREPARATION OF THERAPEUTIC COLLOIDS.—G. W. Boericke, and W. W. Young. 37365.

VITAMIN CONCENTRATES, ETC.—A. E. Briod, and B. R. East. (Nov. 3, '37.) 37421.

METHOD OF OBTAINING AMMONIA from aqueous solutions.—British Bemberg, Ltd. (Germany, Dec. 23, '37.) 37414.

CERAMIC MATERIALS.—British Thomson-Houston Co., Ltd. (United States, Dec. 30, '37.) 37629, 37630.

ARTIFICIAL DISPERSIONS OF RUBBER.—Dispersions Process, Inc. (United States, Jan. 13.) 37281.

ORGANIC SUBSTANCES.—H. Dreyfus. 37428.

COAGULATION OF AQUEOUS DISPERSIONS.—E. I. du Pont de Nemours and Co. (United States, Dec. 24, '37.) 37661.

PROTEOLYTIC ENZYME PREPARATIONS.—L. Elion. 37625.

MANUFACTURE OF SOAP.—H. G. C. Fairweather (Colgate-Palmolive-Peet Co.). 37653.

MANUFACTURE OF CYANO, ETC., COMPOUNDS.—J. R. Geigy, A.-G. (Switzerland, Dec. 27, '37.) 37423.

MANUFACTURE OF DYESTUFFS.—J. R. Geigy, A.-G. (Switzerland, Oct. 7.) 37474.

INSOLUBLE COMPOUNDS OF DYESTUFFS of the pyrone series.—A. G. Green. 37556.

MANUFACTURE OF UNSATURATED ESTERS.—H. Gudgeon, R. Hill, and Imperial Chemical Industries, Ltd. 37506.

ALUMINIUM ALLOY.—H. C. Hall. 37453.

PRODUCTION OF DOUBLE FLUORIDES of alkali metals, etc.—H. W. Heiser. (United States, July 29.) 37300.

MANUFACTURE OF CONDENSATION PRODUCTS.—I. G. Farbenindustrie. (Germany, Dec. 23, '37.) 37378; (Germany, Feb. 28.) 37379, 37380, 37381; (Germany, May 14.) 37382; (Germany, Dec. 5.) 37383; (Germany, Dec. 22, '37.) 37384.

MANUFACTURE OF ADDITION PRODUCTS.—I. G. Farbenindustrie. (Germany, Dec. 22, '37.) 37385.

COVERING OBJECTS WITH A SHEET OF POLYVINYL CHLORIDE.—I. G. Farbenindustrie. (Germany, Dec. 29, '37.) 37424.

PROCESS FOR REMOVING SALTS FROM WATER.—I. G. Farbenindustrie. (Germany, Jan. 5.) 37425.

POLYMERISATION OF BUTADIENES-1-3.—I. G. Farbenindustrie. (Germany, Dec. 24, '37.) 37529.

MANUFACTURE OF MOULDED ARTICLES from artificial masses.—I. G. Farbenindustrie. (Germany, Dec. 27, '37.) 37571.

RECOVERY OF HIGH MOLECULAR CARBOXYLIC ACIDS from their salts.—I. G. Farbenindustrie. (Germany, Dec. 30, '37.) 37637.

MANUFACTURE, ETC., OF ALKYLENE OXIDES.—I. G. Farbenindustrie. (Germany, Dec. 31, '37.) 37638.

MANUFACTURE OF METHINE DYESTUFFS.—I. G. Farbenindustrie. (Germany, Dec. 27, '37.) 37655.

MANUFACTURE OF SURFACE ACTIVE MATERIALS.—Imperial Chemical Industries, Ltd. (United States, Dec. 22, '37.) 37339.

PRINTING INKS.—Interchemical Corporation. (United States, Jan. 18.) 37514.

SETTING FILMS OF COATING COMPOSITIONS containing a urea formaldehyde resin.—Interchemical Corporation. (United States, Jan. 29.) 37515.

MANUFACTURE OF YEASTS.—International Yeast Co., Ltd., E. A. Meyer, and P. W. Chaffe. 37294.

PLASTIC PAINT for cement, etc.—Juveta Co., Ltd., and A. May. 37249.

MANUFACTURE OF AZO DYESTUFFS.—A. H. Knight, and Imperial Chemical Industries, Ltd. 37341.

PRODUCTION, ETC., OF RUBBER VULCANISATION ACCELERATORS.—Monsanto Chemical Co. (United States, Dec. 23, '37.) 37355.

BACTERICIDAL, ETC., PREPARATIONS for human use.—J. F. Moseley. 37413.

MANUFACTURE OF CONDENSATION PRODUCTS.—J. D. Rose, and Imperial Chemical Industries, Ltd. 37507.

METHOD OF PRODUCING RUST-PROOFING PAINTS.—Ruhrstahl, A.-G. (Germany, Feb. 26.) 37359.

METHOD OF RECOVERING ZINC-OXIDE, ETC., from filter dust, etc. Ruhrstahl, A.-G. (Germany, Feb. 26.) 37489.

SEPARATION OF ALUMINIUM FROM ALUMINIUM FOILS associated with foreign substances.—K. Schmidt. (Germany, Feb. 23.) 37665.

MANUFACTURE OF AROMATIC DERIVATIVES OF DIAMINES.—Soc. des Usines Chimiques Rhone-Poulenc, and P. Viaud. 37318.

CHEMICAL MANUFACTURE.—M. C. Taylor, and W. C. Gardiner. 37307.

MANUFACTURE OF EXPLOSIVE COMPOSITIONS, ETC.—V. H. Williams and Imperial Chemical Industries, Ltd. 37340.

POLYMERISATION PRODUCTS.—Wingfoot Corporation. (United States, March 31.) 37264.

POLYMERISATION.—Wingfoot Corporation. (United States, March 31.) 37265.

VULCANISATION OF RUBBER.—Wingfoot Corporation. (United States, April 8.) 37266.

PURIFICATION OF COAL-TAR HYDROCARBONS.—Yorkshire Tar Distillers, Ltd., E. B. Maxted, and S. Billbrough. 37580, 37581.

MANUFACTURE OF GLASS-LIKE QUARTZ.—A. F. Burgess (Vereinigte Glühlampen und Elektrizitäts, A.-G.) 37738.

METHOD OF PRODUCING DISULPHONAMIDES.—Calco Chemical Co., Inc. (United States, Jan. 11.) 37847.

MANUFACTURE OF AROMATIC POLYNUCLEAR ORTHO-HYDROXY-CARBOXYLIC ACIDS containing sulphone groups.—A. Carpmael (I. G. Farbenindustrie.) 37771.

Complete Specifications Open to Public Inspection

PREPARATION OF PIGMENTS of the phthalocyanine series.—Montecatini Soc. Generale Per l'Industrie, Mineraria, ed Agricola. July 3, 1937. 26826/37.

PREPARATION OF METALLIC PHTHALOCYANINES.—Montecatini Soc. Generale Per l'Industria, Mineraria, ed Agricola. July 3, 1937. 27584/37.

GAS-EXPANDED RUBBER SUBSTITUTES, and methods of producing the same.—Expanded Rubber Co., Ltd. July 9, 1937. 1206/38.

MANUFACTURE OF ETHER DERIVATIVES of polyhydric alcohols.—Procter and Gamble Co. July 9, 1937. 2193/38.

PRODUCTION OF WATER-RESISTANT COMPOSITIONS.—International Patents Development Co. July 9, 1937. 14222/38.

PROCESS FOR MANUFACTURING AMINO-METHYLENE KETONES or their derivatives.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. July 9, 1937. 18708/38.

NAIL-VARNISH COMPOSITIONS.—E. I. du Pont de Nemours and Co. July 8, 1937. 19058/38.

MANUFACTURE OF LIQUID ANIMAL-FAT OR OLEO.—E. Andersen-Orris. July 5, 1937. 19424/38.

PROCESS OF MANUFACTURING CEMENT.—Ritter Products Corporation. July 3, 1937. 19558/38.

PREPARATION OF ALKALI METAL PEROXIDES.—Deutsche Gold- und Silber-Scheideanstalt Vorm. Roessler. July 8, 1937. 19597/38.

AFTER-TREATMENT OF SUBSTANTIVE DYEINGS.—I. G. Farbenindustrie. July 3, 1937. 19783/38.

AZO DYESTUFFS, their manufacture and applications.—Imperial Chemical Industries, Ltd. July 3, 1937. 19808/38.

DETERGENTS and method of making them.—Colgate-Palmolive-Peet Co. July 9, 1937. 19896/38.

PROCESS FOR THE MANUFACTURE OF IMPROVED OILS, particularly such as are stable during storage and at increased temperature.—Deutsche Erdol, A.-G. July 9, 1937. 19911/38.

STRETCHING LONG-CHAINED FILAMENT-MOLECULAR POLYMERISATES, in particular polystyrol.—Siemens-Schuckertwerke, A.-G. July 8, 1937. 19944/38.

METHOD FOR PREPARING STABLE DERIVATIVES of dioxy-diamino-arsenobenzol.—Usines Chimiques Des Laboratories Français Soc. Anon., and F. L. Paris. July 6, 1937. 19994/38.

MANUFACTURE OF AZO DYESTUFFS.—I. G. Farbenindustrie. July 6, 1937. 20055/38.

MANUFACTURE AND APPLICATION OF CYCLIC AMIDINES.—I. G. Farbenindustrie. July 7, 1937. 20137/38.

NAIL-VARNISH COMPOSITIONS.—E. I. du Pont de Nemours and Co. July 8, 1937. 20206/38.

OBTAINING BRIGHT-SOAP and glue or size from inferior kinds of resins.—A. E. Grabowski, and J. W. Milodrowski. July 9, 1937. 20332/38.

MANUFACTURE OF *a*-SUBSTITUTED SIDE CHAIN KETONES of the cyclopentano-polyhydrophenanthrene series.—Soc. of Chemical Industry in Basle. July 9, 1937. 20489/38.

MANUFACTURE OF POLYMERISATION PRODUCTS of 2-chloro- or 2-bromo-butadiene-1, 3.—I. G. Farbenindustrie. March 2, 1937. (Divided out of 6584-5/38.) 203/39.

Specifications Accepted with Date of Application

ALCOHOL REPELLENT COMPOSITIONS and process for the manufacture thereof.—E. C. de Stubner. May 22, 1937. 497,836.

ALKYLATION OF PARAFFIN HYDROCARBONS.—A. L. Mond (Universal Oil Products Co.). May 25, 1937. 497,792.

RUBBER LATEX and the treatment of textiles and kindred materials therewith.—R. P. R. Association, Wool Industries Research Association, B. H. Wilsdon, and C. M. Blow. May 27, 1937. 497,793.

PRODUCTION OF FAST DYEINGS.—W. W. Groves (I. G. Farbenindustrie.) June 22, 1937. 497,935.

POLYVINYL ACETAL RESIN COMPOSITIONS.—Carbide and Carbon Chemicals Corporation. July 1, 1936. 497,736.

POLYVINYL ACETAL RESIN COMPOSITIONS.—Carbide and Carbon Chemicals Corporation. July 1, 1936. 497,737.

HEXOIC ACID ESTERS.—Carbide and Carbon Chemicals Corporation. Oct. 10, 1936. 497,738.

POLYVINYL ACETAL RESIN COMPOSITIONS.—Carbide and Carbon Chemicals Corporation. July 16, 1936. 497,739.

MANUFACTURE OF ALKYLATED AMINO-KETONES of the aromatic series.—I. G. Farbenindustrie. Aug. 26, 1936. 497,742.

MANUFACTURE AND PRODUCTION OF INTERPOLAMERISATION PRODUCTS.—G. W. Johnson (I. G. Farbenindustrie.) June 24, 1937. 497,841.

PROCESS FOR THE MANUFACTURE OF AZO DYESTUFFS.—A. Carpmael (I. G. Farbenindustrie.) June 24, 1937. 497,745.

PREPARATION OF A COMPLEX DERIVATIVE OF GOLD.—F. H. Brain, C. S. Gibson, and Imperial Chemical Industries, Ltd. June 24, 1937. 497,746.

HEAVY ALLOYS.—General Electric Co., Ltd., and C. J. Smithells. June 24, 1937. 497,747.

MANUFACTURE OF UNSYMMETRICAL HEPTA-CARBOCYANINE DYES.—I. G. Farbenindustrie. June 25, 1936. 497,752.

MANUFACTURE AND PRODUCTION OF CAPILLARY-ACTIVE AGENTS.—G. W. Johnson (I. G. Farbenindustrie.) June 25, 1937. 498,008.

PRODUCTION OF ORGANIC ACIDS and salts thereof.—U. Busico. June 27, 1936. 497,937.

MANUFACTURE OF ALIPHATIC ALDEHYDES.—Kodak, Ltd. July 3, 1936. 497,757.

RETARDING THE OXIDATION OF SUBSTANCES sensitive to oxidation. G. W. Johnson (I. G. Farbenindustrie.) June 28, 1937. 497,939.

MANUFACTURE AND USE OF ARTIFICIAL RESINS and the like.—Deutsche Hydrierwerke, A.-G. June 27, 1936. 497,767.

MANUFACTURE AND PRODUCTION OF HIGH QUALITY SICCATIVES.—G. W. Johnson (I. G. Farbenindustrie.) June 29, 1937. 498,011.

MANUFACTURE OF EMBEDDING MASSES containing calcium sulphate plaster.—A. Carpmael (I. G. Farbenindustrie.) June 30, 1937. 497,945.

PROCESS FOR THE MANUFACTURE OF POLYMETHINE DYESTUFFS.—A. Carpmael (I. G. Farbenindustrie.) June 30, 1937. 498,012.

MANUFACTURE OF ALUMINIUM SULPHATE.—S. Bretsznajder. June 30, 1937. 497,853.

ZINC SULPHIDE PIGMENTS and methods of preparing same.—Hercules Powder Co. March 17, 1937. 497,855.

NITROGENEOUS ORGANIC COMPOUNDS and their application.—N. W. Cusa, C. E. Salkeld, E. E. Walker, and Imperial Chemical Industries, Ltd. June 30 1937. 497,856.

MANUFACTURE OF CELLULOSE DERIVATIVES and other colloidal substances.—J. E. Jones, J. Y. Davies, and J. F. Neilson. July 1, 1937. 497,963.

METHOD OF STABILISING SALTPETRE MELTS used in the heat-treatment of alloys.—I. G. Farbenindustrie. July 22, 1936. 498,017.

PRODUCTION OF CYANIDES.—W. H. Tant. July 2, 1937. 498,019.

PROCESS FOR THE MANUFACTURE OF VAT DYESTUFFS.—I. G. Farbenindustrie. July 4, 1936. 497,971.

PROCESS FOR THE MANUFACTURE OF CAST SYNTHETIC RESINS from carbamides, phenols, and formaldehyde.—Erinoid, Ltd., and C. A. Redfarn. July 2, 1937. 497,972.

METHOD OF PREVENTING THE FORMATION OF GUM-LIKE PRODUCTS IN OILS.—A. C. G. Egerton. July 2, 1937. 497,973.

MANUFACTURE OF LAMINATED MATERIALS containing metal.—L. G. Lawrie, G. Owen, and Imperial Chemical Industries, Ltd. July 2, 1937. 497,976.

MANUFACTURE OF AZO DYESTUFFS.—Compagnie Nationale de Matieres Colorantes et Manufactures de Produits Chimiques du Nord Reunies Etablissements Kuhlmann. Aug. 12, 1936. 497,862.

PRODUCTION OF ALKALI CELLULOSE from cellulose sheets.—W. Grotzinger, and Baker Perkins, Ltd. July 2, 1937. 497,977.

STABILISED VINYL RESINS.—Carbide and Carbon Chemicals Corporation. Dec. 31, 1936. 497,879.

PRODUCTION OF ALKALINE EARTH METALS by thermal reduction. Magnesium Elektron, Ltd. Jan. 7, 1937. 497,772.

FERMENTATION PROCESS FOR THE PREPARATION OF PAPER-PULP from incrusted cellulose fibres.—E. A. Ritter. June 30, 1937. 497,982.

MANUFACTURE OF LUBRICANTS.—Standard Oil Development Co. July 17, 1937. 497,782.

PRODUCTION OF CARBONACEOUS CHAMOTTE PRODUCTS.—Dortmund Hoerder Huttenverein, A.-G. Dec. 1, 1937. 498,001.

PRODUCING CATALYSTS FOR BENZINE SYNTHESIS.—Ruhrchemie, A.-G. April 1, 1936. 498,007.

MANUFACTURE OF INTERPOLYMERISATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) April 2, 1937. (Samples furnished.) 498,329.

REMOVAL OF NITROGEN OXIDES from gaseous combustion products.—United States Fire Protection Corporation. May 4, 1936. 498,223.

PRODUCING CYCLOPROPANE.—Purdue Research Foundation. June 13, 1936. 498,225.

MANUFACTURE OF SOLUTIONS of highly polymeric substances.—W. W. Groves (I. G. Farbenindustrie.) June 3, 1937. 498,383.

MANUFACTURE OF AMIDE-LIKE CONDENSATION PRODUCTS.—W. W. Groves (I. G. Farbenindustrie.) June 30, 1937. 498,136.

MANUFACTURE OF CATION EXCHANGERS.—W. W. Groves (I. G. Farbenindustrie.) July 1, 1937. 498,251.

PROCESS FOR THE MANUFACTURE AND PRODUCTION OF VALUABLE HYDROCARBON PRODUCTS by the destructive hydrogenation of carbonaceous materials.—H. E. Potts (International Hydrogenation Patents Co., Ltd.). July 2, 1937. 498,300.

CONVERTING ETHYL ALCOHOL into a combustible volatile liquid containing ether.—Crima Soc. Anon. July 4, 1936. 498,232.

SYNTHETIC RUBBER-LIKE MATERIALS.—V. Bryan, B. J. Habgood, and Imperial Chemical Industries, Ltd. July 2, 1937. 498,302.

UREA FORMALDEHYDE RESINS.—Resinous Products and Chemical Co. Aug. 13, 1936. 498,043.

MANUFACTURE OF GLUCOSIDES having an action on the heart.—I. G. Farbenindustrie. July 3, 1936. 498,307.

PROCESS FOR THE MANUFACTURE OF RESIN-LIKE RUBBER TRANSFORMATION PRODUCTS.—Albert Products, Ltd. July 6, 1936. 498,311.

PRODUCTION OF SYNTHETIC RESINS for moulding.—A. Renfrew, and Imperial Chemical Industries, Ltd. July 6, 1937. 498,396.

MANUFACTURE OF CARBOXYLIC ACIDS from olefines.—E. I. du Pont de Nemours and Co. July 7, 1936. 498,398.

WATERPROOFING FIBROUS MATERIALS.—G. W. Johnson (I. G. Farbenindustrie.) July 7, 1937. 498,402.

PROCESS FOR THE MANUFACTURE OF DERIVATIVES OF PHENANTHROLINS.—I. G. Farbenindustrie. July 8, 1936. 498,404.

PROCESS FOR THE MANUFACTURE OF 2.2¹-dimethyl- 4.4¹-dihydroxy-p-phenanthrolin.—I. G. Farbenindustrie. July 8, 1936. 498,405.

MANUFACTURE OF PHENANTHROLIN DERIVATIVES.—I. G. Farbenindustrie. July 8, 1936. 498,406.

Chemical and Allied Stocks and Shares

SENTIMENT in the industrial and other departments of the Stock Exchange has been entirely under the influence of international politics, conflicting views concerning which have prevented improvement in the volume of business. Consequently share values have tended to move to lower levels, but the reaction has been moderate in character.

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Imperial Chemical fluctuated moderately, but at 29s. 9d. are within 3d. of the price ruling a week ago, while Fison, Packard and Prentice at 38s. 9d. have also provided a relatively steady feature. On the other hand, Turner and Newall have been lowered from 76s. 6d. to 75s. 9d., and Associated Cement from 66s. 3d. to 65s. British Oxygen, British Aluminium, Murex and Distillers were also moderately reactionary in sympathy with the general market trend. Lever and Unilever were weak at the time owing to selling from the Continent and are 33s. 9d. at the time of writing, which compares with 36s. 3d. a week ago.

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British Plaster Board were fairly steady at 25s. 6d. under the influence of the acquisition proposed by the company and the directors' intimation that there are reasonable possibilities of a final dividend of 30 per cent. on these 5s. shares, which would again make 50 per cent. for the year, the interim payment having been maintained at 20 per cent. Dunlop rubber declined to 22s. 9d. but later showed a firmer tendency. Borax Consolidated deferred units were fairly steady around 26s., aided by hopes that the dividend may be little changed. For the previous year shareholders received 10 per cent. and this was a conservative payment. Michael Nairn were firm at 57s. 6d. following the annual meeting, but Barry and Staines were lower on balance, and Wall Paper deferred were lowered to 32s. Reckitt and Sons and J. and J. Colman provide steady features, and among paint shares International Paint and Indestructible Paint were little changed, while Pinchin Johnson, although subject to sharp fluctuations, are 23s. 10½d. at the time of writing, or slightly above the price ruling a week ago. Goodlass Wall and Lead Industries ordinary were quoted at 9s. 1½d. Triplex Glass ordinary units made the reduced price of 28s. 9d.

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Boots Drug at 39s. 3d. are little changed on balance, while Sangers were 21s. 3d., and British Drug houses were also quoted at 21s. 3d. Timothy Whites and Taylors, which were 22s. 7½d. a week ago, have improved to 24s. 10½d. at the time of writing, there being hopes that the distribution for the year may be around 30 per cent. and anticipations that, when further capital is required, shareholders may be offered favourable rights of subscription.

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In other directions B. Laporte were quoted at 81s. 3d. and the 5s. units of Greeff-Chemicals Holdings at 5s. 7½d. British Oil and Cake Mills preferred ordinary kept their recent improvement to 41s., while United Premier Oil and Cake 5s. shares were 7s. 4½d. United Glass Bottle ordinary shares remained at 50s. Dorman Long, Consett Iron and most other iron and steel shares were moderately lower on the week, including Stewarts and Lloyds and Tube Investments, although the two last named later tended to attract buyers. Imperial Smelting have lost 1s. to 10s. British Lead Mills 2s. shares were steady at 4s., awaiting the results.

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Oil shares have reacted as a result of the surrounding trend of the Stock Exchange. Anglo-Iranian and Burmah Oil were steadier than Royal Dutch and "Shell" which have an international market and therefore often tend to move rather sharply in price.

Weekly Prices of British Chemical Products

BUSINESS in most sections of the chemical market this week has been rather quiet, the volume of inquiry for home trade being perhaps a little below the average for the period. At the consuming end buyers appear to be calling up their contract commitments with promptness and in this respect the general movement of heavy chemicals has been fairly satisfactory. Values in nearly all directions are steady at recent levels with no important price changes to record. The market in coal tar products continues to be without feature. A few inquiries have been circulating for new business, but actual buying orders are scarce.

Price Changes

Falls: Chromic Acid; Potash, Caustic (Manchester); Cadmium Sulphide; Lead, Red, and Litharge (Glasgow).

MANCHESTER.—There has been no marked expansion of business on the Manchester chemical market during the past week. Users in the Lancashire and Yorkshire districts are in most instances taking up fair quantities of the principal heavy products against existing contracts, with a slightly improving tendency in the flow of specifications for textile chemicals. New inquiry is of moderate volume, but actual fresh bookings this week have been of relatively little consequence, and have mostly been limited to early deliveries. The international political uncertainties are not helping trade. In the by-products section trade has been only moderate, with the benzols and the light distillates the best features.

GLASGOW.—Business in chemicals continues very quiet, both for home trade and export. Prices generally continue quite steady at about previous figures, but red lead and litharge have been reduced £1 per ton, on account of the fall in the price of the metal.

General Chemicals

ACETONE.—£39 to £43 per ton, according to quantity.

ACETIC ACID.—Tech, 80%, £30 5s. per ton; pure 80%, £32 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 5s. 0d. per ton d/d Lancs. GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 1s. to 1s. 1d. per lb. d/d in cylinders. SCOTLAND: 10½d. to 1s. 0½d., containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks

AMMONIUM CHLORIDE.—Grey, £18 10s. per ton, d/d U.K. Fine white, 98%, £17 per ton, d/d U.K.

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

AMMONIUM DICHROMATE.—8½d. per lb. d/d U.K.

ANTIMONY OXIDE.—£68 per ton.

ARSENIC.—Continental material £11 per ton c.i.f., U.K. ports; Cornish White, £12 5s. to £12 10s. per ton f.o.r., mines, according to quantity. MANCHESTER: White powdered Cornish, £16 per ton, ex store.

BARIUM CHLORIDE.—£11 10s. to £12 10s. per ton in casks ex store. GLASGOW: £12 per ton.

BLEACHING POWDER.—Spot, 35/37%, £9 5s. per ton in casks, special terms for contract. SCOTLAND: £9 5s. per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16, crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

BORIC ACID.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

CALCIUM BISULPHITE.—£6 10s. per ton f.o.r. London.

CHARCOAL, LUMP.—£6 to £6 10s. per ton, ex wharf. Granulated, £7 to £9 per ton according to grade and locality.

CHLORINE, LIQUID.—£18 15s. per ton, seller's tank wagons, carriage paid to buyer's sidings; £19 5s. per ton, d/d in 16/17 cwt. drums (3-drum lots); £19 10s. per ton d/d in 10-cwt. drums (4-drum lots); 4¼d. per lb d/d station in single 70-lb. cylinders.

CHROMETAN.—Crystals, 2¾d. per lb.; liquor, £13 per ton d/d station in drums. GLASGOW: 70/75% solid, £5 15s. per ton net ex store.

CHROMIC ACID.—9d. per lb., less 2½%; d/d U.K.

CHROMIC OXIDE.—11½d. per lb.; d/d U.K.

CITRIC ACID.—1s. 0¼d. per lb. MANCHESTER: 1s. 0½d. SCOTLAND: B.P. crystals, 1s. 0½d. per lb.; less 5%, ex store.

COPPER SULPHATE.—£18 5s. per ton, less 2% in casks. MANCHESTER: £19 2s. 6d. to £19 5s. per ton f.o.b. SCOTLAND: £19 10s. per ton, less 5%, Liverpool in casks.

CREAM OF TARTAR.—100%, 92s. per cwt., less 2½%. GLASGOW: 99%, £4 12s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£20-£22 per ton.

FORMIC ACID.—85%, in carboys, ton lots, £42 to £47 per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £3 17s. 6d. to £4 17s. 6d. per cwt. according to quantity; in drums, £3 10s. 0d. to £4 2s. 6d.

HYDROCHLORIC ACID.—Spot, 5s. 6d. to 8s. carboy d/d according to purity, strength and locality.

IODINE.—Resublimed B.P., 6s. 9d. per lb. in 7 lb. lots.

LACTIC ACID.—(Not less than ton lots). Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50%, by vol., £41. One-ton lots ex works, barrels free.

LEAD ACETATE.—LONDON: White, £31 10s. ton lots; brown, £35. GLASGOW: White crystals, £29 10s.; brown, £1 per ton less. MANCHESTER: White, £31; brown, £30.

LEAD, NITRATE.—£32 per ton for 1-ton lots.

LEAD, RED.—£31 15s. 0d. 10 cwt. to 1 ton, less 2½% carriage paid. SCOTLAND: £30 per ton, less 2½% carriage paid for 2-ton lots.

LITHARGE.—SCOTLAND: Ground, £30 per ton, less 2½ %, carriage paid for 2-ton lots.

MAGNESITE.—Calcined, in bags, ex works, about £8 per ton. SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—Solid (ex wharf) £5 10s. per ton. SCOTLAND: £7 5s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 10s. per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 11d. per lb.; powder B.P., 6s. 1d.; bichloride B.P. (corros. sub.), 5s. 2d.; powder B.P. 4s. 10d.; chloride B.P. (calomel), 5s. 11d.; red oxide cryst. (red precip), 7s.; levig., 6s. 6d.; yellow oxide B.P. 6s. 4d.; persulphate white B.P.C., 6s. 1d.; sulphide black (hyd. sulph. cum. sulph. 50%), 6s. For quantities under 112 lb., 1d. extra; under 28 lb., 5d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NITRIC ACID.—Spot, £25 to £30 per ton according to strength, quantity and destination.

OXALIC ACID.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £55 per ton ex store.

PARAFFIN WAX.—SCOTLAND: 3¾d. per lb.

POTASH, CAUSTIC.—Solid, £33 5s. to £38 per ton according to quantity, ex store; broken, £40 per ton. MANCHESTER: £38.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4¼d. per lb. MANCHESTER: £37 per ton.

POTASSIUM DICHROMATE.—5¼d. per lb. carriage paid. SCOTLAND: 5¼d. per lb., net, carriage paid.

POTASSIUM IODIDE.—B.P. 6s. 3d. per lb. in 7 lb. lots.

POTASSIUM NITRATE.—Small granular crystals, £24 to £27 per ton ex store, according to quantity. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9¼d. to 10¼d. per lb. SCOTLAND: B.P. Crystals, 10¼d. MANCHESTER: B.P. 9¼d. to 11½d.

POTASSIUM PRUSSIATE.—5¼d. to 6d. per lb. SCOTLAND: 6¾d. net, in casks, ex store. MANCHESTER: Yellow, 6d. to 6¼d.

PRUSSIATE OF POTASH CRYSTALS.—In casks, 6¾d. per lb. net, ex store

SALAMMONIAC.—Firsts lump, spot, £42 17s. 6d. per ton, d/d address in barrels. Dog-tooth crystals, £36 per ton; fine white crystals, £18 per ton, in casks, ex store. GLASGOW: Large crystals, in casks, £37 10s.

SALT CAKE.—Unground, spot, £3 11s. per ton.

SODA ASH.—58% spot, £5 17s. 6d. per ton f.o.r. in bags.

Soda, Caustic.—Solid, 76/77° spot, 13s. 10s. per ton d/d station. **Scotland**: Powdered 98/99%, £18 10s. in drums, £19 5s. in casks, Solid 76/77° £15 12s. 6d. in drums; 70/73%, £15 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts, 10s. per ton less.

Soda Crystals.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

Sodium Acetate.—£19-£20 per ton carriage paid North. **Glasgow**: £18 10s. per ton net ex store.

Sodium Bicarbonate.—Refined spot, £10 15s. per ton d/d station in bags. **Glasgow**: £13 5s. per ton in 1 cwt. kegs, £11 5s. per ton in 2-cwt. bags. **Manchester**: £10 15s.

Sodium Bisulphite Powder.—60/62%, £12 10s. to £14 per ton d/d in 2-ton lots for home trade.

Sodium Carbonate Monohydrate.—£20 per ton d/d in minimum ton lots in 2 cwt. free bags.

Sodium Chlorate.—£27 10s. to £32 per ton. **Glasgow**: £1 11s. per cwt., minimum 3 cwt. lots.

Sodium Dichromate.—Crystals cake and powder 4½d. per lb. net d/d U.K. with rebates for contracts.

Sodium Chromate.—4½d. per lb. d/d U.K.

4d. per lb. **Glasgow**: 4¼d. net, carriage paid.

Sodium Hyposulphite.—Pea crystals, £15 5s. per ton for 2-ton lots; commercial, £11 5s. per ton. **Manchester**: Commercial, £11; photographic, £15 10s.

Sodium Metasilicate.—£14 5s. per ton, d/d U.K. in cwt. bags.

Sodium Nitrate.—Refined, £8 per ton for 6-ton lots d/d. **Glasgow**: £1 12s. 0d. per cwt. in 1-cwt. kegs, net, ex store.

Sodium Nitrite.—£18 5s. per ton for ton lots.

Sodium Perborate.—10%, £4 per cwt. d/d in 1-cwt. drums.

Sodium Phosphate.—Di-sodium, £12 per ton delivered for ton lots. Tri-sodium, £16 10s. per ton delivered per ton lots.

Sodium Prussiate.—4d. per lb. for ton lots. **Glasgow**: 4d. **Manchester**: 4¼d. to 5d.

Sodium Silicate.—£8 2s. 6d. per ton.

Sodium Sulphate (Glauber Salts).—£3 per ton d/d.

Sodium Sulphate (Salt Cake).—Unground spot, £3 to £3 10s. per ton d/d station in bulk. **Scotland**: Ground quality, £3 5s. per ton d/d. **Manchester**: £3 12s. 6d.

Sodium Sulphide.—Solid 60/62%, Spot, £11 15s. per ton d/d in drums; crystals, 30/32%, £9 per ton d/d in casks. **Manchester**: Concentrated solid, 60/62%, £11; commercial, £8 10s.

Sodium Sulphite.—Pea crystals, spot, £14 10s. per ton d/d station in kegs.

Sulphur Precip.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.

Sulphuric Acid.—168° Tw., £4 11s. to £5 1s. per ton; 140° Tw., arsenic-free, £3 to £3 10s.; 140° Tw., arsenious, £2 10s.

Tartaric Acid.—1s. 1¼d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. **Manchester**: 1s. 1¼d. per lb. **Glasgow**: 1s. 1½d. per lb., 5%, ex store.

Zinc Sulphate.—Tech., £11 10s. f.o.r., in 2 cwt. bags.

Rubber Chemicals

Antimony Sulphide.—Golden, 7d. to 1s. 2d. per lb., according to quality. Crimson, 1s. 6d. to 1s. 7½d. per lb.

Arsenic Sulphide.—Yellow, 1s. 5d. to 1s. 7d. per lb.

Barytes.—£6 to £6 10s. per ton, according to quality.

Cadmium Sulphide.—3s. 0d. to 3s. 3d. per lb.

Carbon Black.—3½d. to 4 1/16d. per lb., ex store.

Carbon Disulphide.—£31 to £33 per ton, according to quantity, drums extra.

Carbon Tetrachloride.—£41 to £46 per ton, according to quantity, drums extra.

Chromium Oxide.—Green, 10½d. to 11½d. per lb.

Diphenylguanidine.—2s. 2d. per lb.

India-rubber Substitutes.—White, 4⅜d. to 5½d. per lb.; dark 3¾d. to 4¼d. per lb.

Lamp Black.—£24 to £26 per ton del., according to quantity. Vegetable black, £35 per ton upwards.

Lead Hyposulphite.—9d. per lb.

Lithopone.—Spot, 30%, £16 10s. per ton, 2-ton lots d/d in bags.

Sulphur.—£9 to £9 5s. per ton. **Sulphur precip.** B.P., £55 to £60 per ton. **Sulphur precip. comm.**, £50 to £55 per ton.

Sulphur Chloride.—5d. to 7d. per lb., according to quantity.

Vermilion.—Pale, or deep, 5s. per lb., 1-cwt. lots.

Zinc Sulphide.—£58 to £60 per ton in casks ex store, smaller quantities up to 1s. per lb.

Nitrogen Fertilisers

Ammonium Sulphate.—The following prices have been announced for neutral quality basis 20.6% nitrogen, in 6-ton lots delivered farmer's nearest station up to June 30, 1939; November, £7 8s.; December, £7 9s. 6d.; January, 1939; £7 11s.; February, £7 12s. 6d.; March/June, £7 14s.

Calcium Cyanamide.—The following prices are for delivery in 5-ton lots, carriage paid to any railway station in Great Britain up to June 30, 1939; November, £7 12s. 6d.; December, £7 13s. 9d.; January, 1939, £7 15s.; February, £7 16s. 3d.; March, £7 17s. 6d.; April/June, £7 18s. 9d.

Nitro Chalk.—£7 10s. 6d per ton up to June 30, 1939.

Sodium Nitrate.—£8 per ton for delivery up to June 30, 1939.

Concentrated Complete Fertilisers.—£11 4s. to £11 15s. per ton in 6-ton lots to farmer's nearest station.

Ammonium Phosphate Fertilisers.—£10 19s. 6d. to £14 16s. 6d per ton in 6-ton lots to farmer's nearest station.

Coal Tar Products

Benzol.—At works, crude, 9½d. to 10d. per gal.; standard motor, 1s. 3½d. to 1s. 4d.; 90%, 1s. 4½d. to 1s. 5d., pure 1s. 8½d. to 1s. 9d. **Glasgow**: Crude, 10d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 4½d. **Manchester**: Pure, 1s. 8d. to 1s. 8½d. per gal.; crude, 1s. per gal.

Carbolic Acid.—Crystals, 6⅝d. to 7⅝d. per lb., small quantities would be dearer; Crude, 60's, 1s. 7½d. to 1s. 10½d.; dehydrated, 2s. 6d. per gal., according to specification; Pale, 99/100%, per lb. f.o.b. in drums; crude, 2s. 1d. per gal.

Creosote.—Home trade, 3½d. to 4d. per gal., f.o.r. makers' works; exports 6d. to 6½d. per gal., according to grade. **Manchester**: 3½d. to 4½d. **Glasgow**: B.S.I. Specification, 6d. to 6½d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5⅜d. to 6½d.

Cresylic Acid.—97/99%, 1s. 6d. to 1s. 9d.; 99/100%, 1s. 9d. to 2s. 6d. per gal., according to specifications; Pale, 99/100%, 1s. 8d. to 1s. 10d.; Dark, 95%, 1s. 4d. to 1s. 5d. per gal. **Glasgow**: Pale, 99/100%, 5s. to 5s. 6d. per gal.; pale, 97/99%, 4s. 6d. to 4s. 10d., dark, 97/99%, 4s. 3d. to 4s. 6d.; high boiling acids, 2s. to 2s. 6d. American specification, 3s. 9d. to 4s. **Manchester**: Pale, 99/100%, 1s. 8d. to 1s. 9d.

Naphtha.—Solvent, 90/160, 1s. 6d. to 1s. 7d. per gal.; solvent, 95/160%, 1s. 7d. to 1s. 8d., naked at works; heavy 90/190%, 1s. 1d. to 1s. 3d. per gal., naked at works, according to quantity. **Glasgow**: Crude, 6½d. to 7½d. per gal.; 90%, 160, 1s. 5d. to 1s. 6d., 90%, 190, 1s. 1d. to 1s. 3d.

Naphthalene.—Crude, whizzed or hot pressed, £4 10s. to £5 10s. per ton; purified crystals, £10 per ton in 2-cwt. bags. **London**: Fire lighter quality, £3 to £4 10s. per ton. **Glasgow**: Fire lighter, crude, £6 to £7 per ton (bags free) **Manchester**: Refined, £12 to £13 per ton f.o.b.

Pitch.—Medium, soft, 30s. per ton, f.o.b. **Manchester**: 28s. to 30s. f.o.b., East Coast. **Glasgow**: f.o.b. Glasgow, 35s. to 37s. per ton; in bulk for home trade, 35s.

Pyridine.—90/140%, 12s. to 13s. 6d. per gal.; 90/160%, 10s. to 11s. per gal.; 90/180%, 3s. to 4s. per gal. f.o.b. **Glasgow**: 90% 140, 10s. to 12s. per gal.; 90% 160, 9s. to 10s.; 90% 180, 2s. 6d. to 3s. **Manchester**: 11s. to 13s. 6d. per gallon.

Toluol.—90%, 1s. 11d. per gal.; pure 2s. 3d. **Glasgow**: 90% 120, 1s. 10d. to 2s. 1d. per gal. **Manchester**: Pure, 2s. 3d. per gallon, naked.

Xylol.—Commercial, 1s. 11d. to 2s. per gal.; pure, 2s. 3d. to 2s 3½d. **Glasgow**: Commercial, 2s. to 2s. 1d. per gal.

Wood Distillation Products

Calcium Acetate.—Brown, £6 15s. to £9 5s. per ton; grey, £8 5s. to £8 10s. **Manchester**: Brown, £8 10s.; grey, £10.

Methyl Acetone.—40.50%, £32 to £35 per ton.

Wood Creosote.—Unrefined, 6d. to 8d. per gal., according to boiling range.

Wood Naphtha, Miscible.—2s. 8d. to 3s. per gal.; solvent, 3s. to 3s. 3d. per gal.

Wood Tar.—£3 to £8 per ton, according to quality.

Intermediates and Dyes

Aniline Oil.—Spot, 8d. per lb., drums extra, d/d buyer's works.

Aniline Salts.—Spot, 8d. per lb. d/d buyer's works, casks free.

Benzidine, HCl.—2s. 7½d. per lb., 100% as base, in casks.

Benzoic Acid, 1914 B.P. (ex toluol).—1s. 11½d. per lb. d/d buyer's works.

***m*-Cresol 98/100%.**—1s. 8d. to 1s. 9d. per lb. in ton lots.

***o*-Cresol 30/31° C.**—6½d. to 7½d. per lb. in 1-ton lots.

***p*-Cresol, 34-5° C.**—1s. 7d. to 1s. 8d. per lb. in ton lots.

Dichloraniline.—2s. 1½d. to 2s. 5d. per lb.

Dimethylaniline.—Spot, 1s. 7½d. per lb., package extra.

Dinitrobenzene.—7½d. per lb.

Dinitrochlorbenzene, Solid.—£79 5s. per ton.

Dinitrotoluene.—48/50° C., 8½d. per lb.; 66/68° C., 11d.

Diphenylamine.—Spot, 2s. 2d. per lb., d/d buyer's works.

Gamma Acid, Spot, 4s. 4½d. per lb. 100% d/d buyer's works.

H Acid.—Spot, 2s. 7d. per lb.; 100% d/d buyer's works.

Naphthionic Acid.—1s. 10d. per lb.

***β*-Naphthol**—£97 per ton; flake, £94 8s. per ton.

***α*-Naphthylamine.**—Lumps, 1s. 1d. per lb.

***β*-Naphthylamine.**—Spot, 3s. per lb.; d/d buyer's works.

Neville and Winther's Acid.—Spot, 3s. 3½d. per lb. 100%.

***o*-Nitraniline.**—4s. 3½d per lb.

***m*-Nitraniline.**—Spot, 2s. 10d. per lb. d/d buyer's works.

***p*-Nitraniline.**—Spot, 1s. 10d. to 2s. 1d. per lb. d/d buyer's works.

Nitrobenzene.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.

Nitronaphthalene.—9½d. per lb.; P.G., 1s. 0½d. per lb.

Sodium Naphthionate.—Spot, 1s. 11d. per lb.; 100% d/d buyer's works.

Sulphanilic Acid.—Spot, 8¾d. per lb. 100%, d/d buyer's works

***o*-Toluidine.**—10½d. per lb., in 8/10 cwt. drums, drums extra.

***p*-Toluidine.**—1s. 10½d. per lb., in casks.

***m*-Xylidine Acetate.**—4s. 3d. per lb., 100%.

Forthcoming Events

London.

January 23.—Chemical Club. 2 Whitehall Court. 8.15 p.m. Dr. Olaf Bloch, "The Answer is in the Negative."

Institution of the Rubber Industry. Northumberland Rooms, Northumberland Avenue, W.C.2. 7.30 p.m. J. A. Plaizier, "Rubber in Roadways."

January 24.—Northampton Polytechnic. St. John Street, E.C.1. 8 p.m. S. Wernick, "A Decade of Progress in the Electro-Deposition of Metals: Modern Plating Plant."

Royal Institution. 21 Albemarle Street, W.1. 5.15 p.m. M. Polanyi, "An Introduction to Chemical Mechanics."

January 26.—Sir John Cass Technical Institute. Jewry Street, Aldgate, E.C.3. 7 p.m. S. Judd Lewis, "Spectroscopic Analysis."

Institution of Chemical Engineers. Joint meeting with the Institute of Structural Engineers. 11 Upper Belgrave Street, S.W.1. 6.30 p.m. R. Fitzmaurice and Dr. F. M. Lea, "Floors for Industrial Purposes."

Royal Society. 4.30 p.m. W. J. C. Lawrence and others. "The Distribution of Anthocyanins in Flowers, Fruits, and Leaves."

January 27.—Royal Institution. 21 Albemarle Street, W.1. 9 p.m. J. D. Bernal, "Structures of Proteins."

January 31.—Royal Institution. 21 Albemarle Street, W.1. 5.15 p.m. M. Polanyi, "An Introduction to Chemical Mechanics."

Birmingham.

January 23.—Chemical Society. Joint meeting with the Birmingham University Chemical Society. The University, Edgbaston. 5 p.m. Professor C. R. Harington, "Recent Synthetic Studies in Immuno Chemistry."

January 25.—Institute of Chemistry. Symposium: History of Industrial Chemistry in the Midlands.

January 30.—The Chemical Society. Joint meeting with the Birmingham University Chemical Society. The University, Edgbaston. 5 p.m. Professor J. L. Simonsen. "The Structure of Sesquiterpenes and their Derivatives."

Bristol.

January 26.—Institute of Chemistry. Bristol University, Woodland Road. 5.30 p.m. A. W. Broom, "Recent Progress in Biochemical and Medical Research."

Edinburgh.

January 27.—Chemical Society. North British Hotel. 7.30 p.m. Joint meeting with the Institute of Chemistry and the Society of Chemical Industry. Professor J. W. Cook, "Carcinogenic Chemical Compounds."

Leeds.

January 27.—Chemical Society. The University. 7 p.m. Meeting for the reading of original papers.

Manchester.

January 27.—Literary and Philosophical Society, Chemical Section. 36 George Street. 7 p.m. Dr. H. A. Harrison, "Some General Aspects of Paper Making."

Newcastle.

January 27.—Bedson Club. King's College. 6.45 p.m. Dr. J. Monteath Robertson, "The Dimensions of Some Organic Molecules."

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

HARTON DYEWORKS, LTD., South Shields. (M., 21/11/39.) January 7, mortgage to South Shields Commercial Permanent Building Society securing £2,000 and further advances, etc.; charged on 31/33 Fowler Street, South Shields. *£10,162. March 1, 1938.

J. HOLROYD AND CO., LTD., Huddersfield, textile dyers, etc. (M., 21/11/39.) January 5, £2,000 debenture stock, part of amount already registered. *£20,066. November 27, 1937.

Satisfaction

COLLEDGE ROY AND CO., LTD., Manchester, oil and fat refiners, etc. (M.S., 21/1/39.) Satisfaction January 9, of mortgage registered April 14, 1930, to extent of £3,000.

Company News

Thomas Bolton and Sons, Ltd., copper refiners, etc., have declared an interim dividend of 2½ per cent., less tax (the same).

Thompson Brothers (Bilston), Ltd., have declared a dividend of 3 per cent., tax free, on preference shares in respect of the six months ending January 31.

National Carbonising Co., Ltd., have increased their nominal capital by the addition of £5,000 beyond the registered capital of £85,000. The additional capital is divided into 50,000 ordinary shares of 2s. each.

Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE and other trade journals, have declared the usual dividends, less tax, payable on February 15, namely, 3 per cent. on Preference shares for half-year ended December 31, 1938; interim dividend of 5 per cent. on Ordinary shares; 1s. per share on Deferred shares.

New Companies Registered

The Institute of Applied Pharmaceutics, Ltd. 348,475.—Company limited by guarantee without share capital. To acquire all or part of the property and liabilities of the St. Vincent Association; to promote the study in relation to the manufacture, propaganda and distribution of medical, surgical, chemical and pharmaceutical supplies, chemicals and products manufactured and sold in connection with those and allied industries, etc. Council: J. Macvie Hill, senior medical representative, Crookes Laboratories; Richard R. Coates, managing director, Coates and Cooper, Ltd.; George L. J. Cooper, managing director, Coates and Cooper, Ltd.; John F. Rogers, director, Petrolagon Laboratories, Ltd.; Francis E. Corringham, medical representative and pharmacist, Reckitt and Colman; Kenneth J. Golds, director, William R. Warner and Co., Ltd.; John F. Murphy. Registered office: 4 Copthall Chambers, E.C.2.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Argentina.—A firm of agents established at Buenos Aires wishes to obtain the representation of United Kingdom manufacturers or exporters of industrial machinery, raw materials, and chemical products for Argentina. (Ref. No. 35.)